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ON THE 1<sup>ST</sup> OF JUNE,  
THE PINE APPLE:  
ITS CULTURE, USES, AND HISTORY.

By the EDITOR, and J. BARNES, Gardener to the Dowager Lady Rolle,  
Bicton, near Sidmouth, Devon.



THE  
GARDENER'S  
MONTHLY VOLUME.

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THE AURICULA;  
ITS CULTURE AND HISTORY.

By GEORGE W. JOHNSON, Editor of the "Gardener's Almanack,"  
&c.; and J. SLATER, Florist, Cheetham Hill, near Manchester.

THE ASPARAGUS;  
ITS CULTURE AND HISTORY.

By the SAME, and ROBERT ERRINGTON, Gardener to Sir P. Egerton, Bart., at Oulton Park, near Tarporley, Cheshire.

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# THE GARDENER'S MONTHLY VOLUME.

EDITED BY GEORGE W. JOHNSON, ESQ.

*Author of "The Dictionary of Modern Gardening," "The Gardener's Almanack," &c.*

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## THE AURICULA.

---

### HISTORY.

THERE is no valid reason for believing that this beautiful flower—this “powdered beau” of our parterres—was cultivated by the ancients. The Roman legions traversed its native regions—the Alps—and it may have attracted, by its beauty or its fragrance, a transient notice, but we have no record of its being added to their pleasure-ground adornments. Indeed, they paid little attention to floriculture, and, if the Rose be excepted, we have but scanty notice even of any garden flower. Fabius Columna, it is true, thought that the Auricula is the *Alisma* or *Damasonium* of Dioscorides (l. iii. c. 169), and other classic naturalists, and that it is mentioned by Pliny (l. xxv. c. 10), but these are mere surmises, having no better foundation than that it would be as difficult to prove them erroneous as it is hopeless to shew that they are correct.

That the Auricula was but little known, even at the commencement of the 17th century, is demonstrated by the fact that neither Dodonæus nor Lyte

mention it, though it is fully described by their contemporary, Gerard.

That it was previously known to continental botanists is certain, for Bauhin quotes authorities who had noticed it; and adds, that it was called *Auricula Ursi*, or Bear's-ear, from its leaves resembling that animal's ear. In his *Phytopinax*, published in 1569, he enumerates 12 sorts.

The *Auricula* is described and figured by Gerard in his *Herbal*, which appeared in 1597, and it is there called the Bear's-ear or Mountain Cowslip. He says there were then many sorts, giving drawings of eight, the yellow, the purple, the scarlet, the blush-coloured, and several reds. Like Bauhin, he gives them the specific botanical name of *Auricula Ursi*; but by Matthioli and others it was named *Sanicula alpina*, from its supposed healing virtues and mountain birth-place. It was often called by ladies the French Cowslip.\* Gesner named it *Lunaria anthritica* and *Paralytica alpina*. Parkinson says it obviously belonged to the Cowslip family, but Ludwig was the first to arrange it there under the generic name of *Primula*.

\* It is very certain that they were thus early much cultivated by French florists, for there is a poem in their praise, in a curious work published at Douay, in 1616, entitled "*Jardin d'Hyver*;" and with the verses are numerous drawings of the *Auriculas*, or "*d'Oreilles d'Ours*," as they are there called.

Gerard says that the eight kinds he enumerates were then commonly grown in the gardens about London, but it is evident they were not much esteemed; nor is any notice taken of raising varieties from seed.

This neglect soon passed away, for Johnson, in his edition of Gerard, published in 1633, says that there were then a very great many varieties of these flowers growing in the gardens of Mr. Tradescant and Mr. Tuggie. Tradescant's garden was at Lambeth, and he, at the time Johnson wrote, was gardener to Charles I. Tradescant was a Dutchman; and there is little room for doubting, that, bringing with him that knowledge of floriculture for which his countrymen were even then justly famed, he applied it to the improvement of the Auricula, which in Holland had been neglected. At all events, the attention then paid to this flower in England was as great even as at present. We had the credit then of supplying the Dutch florists with an endless variety of new sorts; whereas, latterly, we have been in the habit of receiving supplies of this plant every year from them, till the late war closed all communication between the two countries. (*Emmerton's Auricula*, 2.)

Parkinson, in his "Paradisus," published in 1656, says that "those who had been industrious in sowing the seeds of the several sorts" had so succeeded in raising varieties that he should not be able to enume-

rate them all. He describes, however, 21 varieties; and the drawing of one of these, "The greatest faire yellow Beare's Eares with eyes," shews that the florists had indeed much improved the flower; for, in the sketches given by Gerard and Lyte, the pips are small, and only four or five in a truss, but in this and others, given by Parkinson, the pips are large, and increased in number to from 8 to 13. Many other varieties, he adds, were to be found, with those that are curious conservers of these delights of nature, either naturally growing on mountains, or raised from seed, as is more probable; for several varieties have been observed to be gotten by sowing of the seed, every year lightly shewing a diversity, not observed before, either in the leaf or in the flowers.

The raising varieties from seed was then well known, but regular canons for distinguishing a good flower were not yet established, as they probably were when the "Complete Florilege" was published by John Rea, Gent.: in the third edition of which work, printed in 1702, there are many varieties noticed, and named after their raisers. (*Miller's Dict.*)

Mr. Hughes, in his "Flower Garden," published in 1672, gives a short direction for its cultivation, and is the first writer on gardening we have met with who speaks of it as the "Auricula."

The cultivation of this flower continued to increase in favour, and it is the first of our shew flowers that

had published separate canons whereby the superiority of rival flowers might be determined. The work in which these appeared was written by Mr. James Thompson, a florist of Newcastle, and published at that town, in 1757, under the title of “The distinguishing properties of a fine Auricula.”

These, however, were not the first ; for that fertile writer on such subjects, Richard Bradley, in his “New Improvements of Gardening,” published in 1718, gives seven characteristics of excellence which are “required by skilful florists” to be possessed by the Auricula. His directions for the culture of the flower, and his compost, are not so mistakenly rich and stimulating as was recommended by his successors.

In Lancashire, too, the cultivation of this flower was at that time sedulously pursued even by the weavers, for, from living witnesses, we have authentic evidence that the Auricula was cultivated at Middleton, and a few miles round, as early as the year 1720. James Fitton, of Middleton, began growing when he was from 14 to 15 years old ; and at that time they were cultivated to some extent ; and the growers of that period had devoted years to their improvement and cultivation ; so, by adding 25 years to the time when he began, which was the year 1746, there is direct evidence that they have been cultivated at least 127 years. Fitton died at the good old age of 86

years, thirty years ago, and his son, who is yet an Auricula grower, is now upwards of 80, and he says from his infant years he was attached to them. Another Auricula grower, named Joseph Partington, of Tonge, adjoining Middleton, has been a grower 71 years, and is the oldest now living: he is a hale hearty old man of 86, and his delight is to talk of old times. When a boy, about 16 years old, he took the first prize at Eccles, about four miles from Manchester, with Taylor's Victory (Green-edged), for which he received 21s.; so that shews can clearly be proved to have existed above 70 years. In Partington's early years the principal growers were, Abel Buckley, of Tonge; John Buckley, of Chadderton; John Grime, sen. (the raiser of Privateer), of Royton, near Oldham; John Grime, jun., John Taylor, of Royton (the raiser of Taylor's Glory); James Mills, William Kenyon, of Middleton (raiser of Ringleader); and John Heyes, of Castleton Moor, near Rochdale (the raiser of Lovely Ann); and all within four miles of each other.

Taylor's Victory (green-edged), 1746, was considered the best out; and Partington says that there were as many varieties then grown as now. Redmayne's Metropolitan came out about 65 years ago, and was introduced by a florist named Tottle, and was generally said to have been a stolen plant. Heyes bought it, and sold it out as Heyes' Apollo;



and very shortly, when sold out into the south, the original name came, viz., Redmayne's Metropolitan. About 50 years ago this variety was sold as low as sixpence per plant, and was so plentiful that it was grown upon the borders in the open ground. Frames were but coming into use, and, previous to their introduction, the pots were, during winter, turned upon their sides, so that the wet could not injure the plant. A gentleman named Wrigley, of Langley Hall, was a grower in 1776, and he grew his plants in a kind of greenhouse, and open on the north side.

In 1776 the principal varieties were, Taylor's Victory (green-edged), Pott's Delegate (do.), Clough's Defiance (do.), Clough's Jingling Johnny (do.), Riding's Junius (grey-edged), Hughes' Pillar of Beauty (white-edged), Lee's Lord Lee (self), Ashworth's Man-of-War (grey-edged), and Pope's Gardener (self), considered at that period very fine.

The oldest auricula known was Rule Arbitrer (green-edged); and was generally grown in 1757. Pott's Eclipse (green-edged) in 1767. About 1785 Grime's Privatcer was introduced, and shewn a long time as a green-edged flower; as were Slater's Cheshire Hero (green-edged), Popplewell's Conqueror (white-edged), Grime's Hyder Ali (green-edged), Wrigley's Northern Hero (green-edged), Walker's Goldfinch (yellow self), now known as Gorton's Goldfinch, Gorton's Champion (green-edged), Gorton's Stadtholder (yellow self).

The best proof of the rising public favour is, the fact that florists began to make it a prominent portion of their stocks. Thus we find its varieties enumerated in all their catalogues of the period ; and Mr. James Justice, one of the best amateur collectors of his day, boasts, in his “ Scots’ Gardener’s Director,” published in 1754, that he had the largest collection of Auriculas in Europe.

Soon after, flourished Matthew Kenney, a gardener by profession, and who Mr. Hogg mentions as, perhaps, one of the most successful and eminent growers of Auriculas at that time, and won as many prizes as most men during the course of ten or twelve years when he lived at Totteridge, Middlesex. He certainly had all the benefit of air, situation, and soil, which, coupled with his fondness for the flower, and his skilful treatment of it, to say nothing of his being almost constantly in the garden, gave him a decided superiority over many of his competitors, and ensured, as it were, his chance of success. He always kept by him a quantity of sound stable loam, of rather a sandy nature ; this he sweetened by frequent turning. His next principal ingredient was sheep-dung and hay litter, well rotted by being turned, mixed, and fermented in the same manner as the gardener does horse-dung and straw litter. This he never made use of under 12 or 18 months, when it had the appearance of leaf or fine vegetable mould ; sometimes

he put to it a small portion of cow-dung, but this very seldom ; a little clean coarse sand was generally added. These formed his compost for growing this flower ; but he had another of a richer quality, with which he used to top-dress his plants, and this he would do sometimes twice in the year. When he killed any sheep, he always reserved the blood, and mixed it with the dung of poultry. These two ingredients he added to his loam and sheep-dung, and these constituted his compost for surface-dressing. In fresh potting, every year he trimmed and shortened the fibres, and reduced the roots, with the mould adhering to them, to the bigness of a moderate-sized ball, but never shook the mould completely from the roots, if they were sound and going on well, until the third year ; he then would wash the roots in water, examine them closely, shorten the tap or main root, and cut away any decayed or unsound parts ; but if any plant appeared sickly at any time, he always served it in the same manner. He was particularly careful in making the holes at the bottom of the pots larger, and putting in three or four pieces of broken tile to drain the water off, and prevent it from becoming stagnant at the bottom of the pots : this, though apparently a trifling circumstance, ought always to be well attended to. The proportions he used were, one-third loam, two-thirds sheep-dung and hay-litter, and one-tenth coarse sand. (*Hogg's Auricula*, 124.)

In 1792 appeared James Maddock's "Florist's Directory," and in this is contained the first copious treatise on the culture of the Auricula with which we are acquainted. Maddock was a Quaker, originally bred a gardener at Warrington, in Lancashire, but, at the time he wrote, carrying on the business of a florist at Walworth. Mr. Hogg says that, it is well known to florists now living that Mr. Maddock neither excelled in the culture of the Auricula nor of the Carnation, but that he managed Tulips and Ranunculuses well.

As far as we have been able to make out from old records of Auricula shews, and from still older living authorities, the following appear to be the birth-times and names of varieties, some of which are still high in favour.

In 1802, the leading *Green-edged* varieties were Barlow's King, raised near Ashton-under-Lyne, and sold out by a person named Stretch, a very old Auricula grower, now dead, and called at that time Stretch and Barlow's King.

Lee's Colonel Taylor\*  
Whittaker's Rule All

Pollitt's Highland Laddie  
Dean's Smoker

\* Lee's Colonel Taylor, Lee's Talavera, Stretch's Alexander, and Staveley's Wellington, were raised by a florist named Staveley, who sold them when only a few plants: and when sold out were called by the names of the parties who bought them. He raised the four varieties from an old sort called Rone's Farmer.

|                          |                       |
|--------------------------|-----------------------|
| Clegg's Black and Green  | Rone's Farmer         |
| Wild's Lord Bridport     | Wild's Colonel Hanson |
| Thornicroft's Invincible |                       |

*Grey-edged.*

|                           |                         |
|---------------------------|-------------------------|
| Dean's Regulator          | Butterworth's Lord Hood |
| Heyes' Lovely Ann         | Harrison's William Pitt |
| Medcalf's Lancashire Hero | Clegg's Lady of Honour  |
| Ashworth's Man-of-War     |                         |

*White-edged.*

|                             |                           |
|-----------------------------|---------------------------|
| Hughes' Pillar of Beauty    | Taylor's Incomparable     |
| Lee's Bright Venus          | Scholes' Maid of the Mill |
| Lee's Earl Grosvenor        | Empress of Russia         |
| Crompton's Admiral Gardiner | Dyson's Queen             |
| Popplewell's Conqueror      | Foden's Fair Rosamond     |
|                             | Wild's Black and Clear    |

*Selfs.*

|                                                     |                          |
|-----------------------------------------------------|--------------------------|
| Grime's Flora's Flag                                | Nicholson's Bright Venus |
| Gorton's Grand Turk                                 | (yellow)                 |
| Whittaker's True Blue                               | Redstart and Wild's Blue |
| Pope's Cardinal Fleury,<br>called now only Cardinal | Chrystal.                |

It must be observed that many of the older varieties were still exhibited at this time, and were winners. From 1802 to 1820 the following new varieties were exhibited in addition :

*Green-edged.*

|                       |                           |
|-----------------------|---------------------------|
| Buckley's Jolly Tar   | Warris' General Blucher   |
| Rider's Waterloo      | Taylor's Ploughboy        |
| Stretch's Alexander   | Egerton's Lord Combermere |
| Hoffley's Lord Nelson | Lee's Talavera            |
| Moore's Jubilee       | Thornicroft's Invincible  |
| Booth's Freedom       | Clough's Dolittle         |
| Lord Lascelles        | Partington's Trafalgar    |
| Pearson's Bajadoz     |                           |

|                              |                             |
|------------------------------|-----------------------------|
| Archer's Champion of England | Faulkner's Manchester Hero  |
| Duke of Wellington           | Pollitt's Woodland Laddie   |
| Glory of Bolton              | Pearson's Beauty of England |
| Major Cartwright             | Thompson's Revenge          |
| Clegg's Sovereign            | Rider's Sovereign           |
| Commander-in-Chief           |                             |
| Pearson's Liberty            |                             |

*Grey-edged.*

|                                |                         |
|--------------------------------|-------------------------|
| Heyes' Lovely Ann              | Reform                  |
| Cox's British Hero             | Princess Elizabeth      |
| Atcherley's Alpine Shepherdess | Bright Phœbus           |
| Ashworth's Rule All            | Potts' British Champion |
| Colonel Wortley                | Barlow's Morning Star   |
| Dickinson's Matchless          | Harrison's William Pitt |
| Sir Sidney Smith               | Hill's Lady Stamford    |
| Kenyon's Surprise              | Lee's Sir Wm. Wallace   |
| Wild's Highland Lass           | Bishop of Manchester    |
| Thompson's Bang-up             | Booth's Ranger          |
| Galloway's Glory of Oldham     | Earl Grey               |
|                                | Hope's Prince of Orange |

*White-edged.*

|                          |                        |
|--------------------------|------------------------|
| Taylor's Glory           | Brooks' Dreadnought    |
| Scholes' Mrs. Clarke     | Lady Derby             |
| Done's Rule All          | Oddie's Queen Caroline |
| Hughes' Liberty          | Mellor's Fair Lady     |
| Cox's Pillar of Beauty   | Williamson's Britannia |
| Darlington's Lord Nelson |                        |

*Selfs.*

|                       |                       |
|-----------------------|-----------------------|
| Bishop of Lichfield   | Carding's Forester    |
| Mellor's Lord Howe    | Ancient Lady          |
| Hopkin's Mine of Gold | Comet                 |
| Queen of May          | Pope's Lady Dartmouth |
| Porter's King         | Squire Mundy          |
| Fair Helena           | Parke's Black Joke    |

|                          |  |                |
|--------------------------|--|----------------|
| Beesley's New Metropoli- |  | Vett's King    |
| tan                      |  | Porter's Queen |
| Faulkner's Hannibal      |  | Doctor Syntax  |
| Mount Pleasant           |  |                |

Next in order of time came Thomas Hogg, formerly a schoolmaster at Paddington, but afterwards a florist at the same place. In 1812 he published a "Practical Treatise on the Carnation, Auricula, &c.," full of excellent directions for their culture, but it is equally well known of him, as he says it was of Maddock, that he excelled in the cultivation of other flowers (the Carnation, Pink, and Piccotee) more than in that of the Auricula. He says, in his "Supplement" to that treatise, published in 1833, that he aided James Emmerton in the writing and compilation of his "Plain Treatise on the Culture of the Auricula," first published in 1816.

Emmerton was a florist at Barnet, and an enthusiastic admirer of this flower; and, when he first patronised it, he says there were not more than a dozen persons near London who were favourably known as cultivators of the Auricula. He is the best authority we know on the management of this flower, excepting in the preparation of the compost for it. That which he recommends is, beyond all doubt, too rich and stimulating.

Mr. Hogg observes, upon this point, that the ingredients which Emmerton recommends, for the most



part, are of a nature too filthy and offensive for general adoption, as well as too tedious in preparation, and very prejudicial, if used prematurely; but nothing could ever shake his belief in their excellence, power, and efficacy. Emmerton used to say, "My father used them, and I used them after him, and made improvements upon them, and nobody grew Auriculas better;" and it is but justice to add, that the Auriculas which the florists about Barnet, Totteridge, and Finchley, exhibited at that time—Kenney and Emmerton in particular—have not been surpassed, if equalled, by those of any florist of the present day; they were remarkable for their bold trusses, broad expanded pips of brilliant colours, strong stems, and large fleshy foliage—indisputable proofs of good culture. (*Hogg's Supplement*, 158.)

On this last remark made by Mr. Hogg, it is to be observed that it is doubtlessly true that, by the use of highly stimulating manures, it is quite possible to grow large and luxuriant Auriculas, but the plants will not bear such treatment more than two or three years. They then canker and die. Besides, it is quite as possible to grow them as fine in a less stimulating compost, and then they endure for many years. This was done by Matthew Kenney, instanced by Mr. Hogg as a successful cultivator; and it is now done annually by the weavers in and about Manchester.

The Auricula is, indeed, the poor man's flower; it

is hardy, and takes up but little room, even when requiring shelter, so that it is suitable for petting by those who love floral beauties, yet are restricted in the means for gratifying the taste. Auricula shews are now to be found in many villages of almost every English county ; and it is gratifying to be able to say, with truth, that the patient concentrated practice of the poor man usually distances, at these exhibitions, the more scienced efforts of the professional gardener. It is gratifying, because we would always have him the best cultivator who watches nature most closely. It is a wholesome lesson to us ; and how successful have been the humble cultivators of this flower in the neighbourhood of Manchester, we have already noticed.

---

## BOTANICAL CHARACTERS.

**PRIMULA AURICULA**—the garden Auricula, or Bear's-ear—belongs to the Pentandria Monogynia class and order of the Linnæan system, and to the Natural Order Primulaceæ.

*Leaves*, obovate, fleshy, succulent, with the edges mealy ; the young leaves are entire, the adult ones serrate above the middle. *Petioles* leafy or winged. *Leaflets* of the involucre unequal, wide, lanceolate, or blunt. *Stalk*, many flowered, about the length of the leaves. *Flowers*, very sweet, four or five, in an

upright umbel. Calyx, one-third of the length of the tube of the corolla, bell-shaped, toothed, mealy, as is also the scape. Tube of the corolla gradually widening upwards, not contracted at the neck; border concave, the segments emarginate but not deeply, and not cut to the neck. The most common colours are yellow or red, but it is found also purple and variegated, with a white eye, powdered with meal. *Capsule*, one-celled, spherical or nearly so, flattened a little at top, of a coriaceous-cartilagenous substance, sprinkled with meal; six-valved.

It is a native of the mountains of Switzerland, Austria, Styria, Carniola, Savoy, and Piedmont; also about Astracan. It flowers in April and May. In its wild state it is much less mealy than when cultivated.

We are not aware of any chemical analysis of this plant. It certainly has no active principle in its composition. The mealy powder, which so characterises this plant, seems of a resinous nature, and well calculated to repel excessive moisture.

---

### VARITIES.

THE varieties of the *Auricula* are divided into two groupes, *Selfs* and *Edged*, of which we will give separate and descriptive lists. *Alpines*, although really *Auriculas*, are not admitted as such by florists.

Under the directions for raising seedlings, we shall include suggestions for obtaining superior varieties ; and will observe only here, that although many are produced every year, it takes some time before they get abroad. The florist who has been lucky enough to raise a fine flower is seldom inclined to part with any of it till he has been enabled to increase it to ten or a dozen plants, which are generally sold out at one appointed time ; for, unless he can make something by it at the beginning, to remunerate him for his trouble, he will have little chance of doing it afterwards. Some plants throw out offsets freely, and are easily propagated, while others do it very slowly ; so that it often takes four or five years of careful culture to raise even six plants of some kinds. This is the case with Lee's Colonel Taylor and Hedge's Britannia ; added to which, plants of Colonel Taylor seldom survive the fifth or sixth year.

The following are lists of flowers at present cultivated, worthy of being in every large collection. Those marked with an asterisk are the best.

*Painted*, *Variegated*, or *Edged*, are those most highly prized, and have their colours divided into three clearly defined bands ; the inner circle or *paste* round the eye being white, and the *tube* in the centre yellow ; the middle band or *ground colour* some shade of violet, or dark purple, and the outer circle or *edge* either green, grey, or white.

They are classed, according to the colour of the edge, as follows :

**GREEN-EDGED.**

|                                                         |                                           |
|---------------------------------------------------------|-------------------------------------------|
| *Borth's Freedom                                        | *Falkner's Ne Plus Ultra                  |
| *Oliver's Lovely Ann,<br>(shewn also in grey-<br>edged) | *Pearson's Bajadoz                        |
| *Page's Champion                                        | Wild's Lord Bridport                      |
| *Stretch's Alexander                                    | Hedges' Britannia (shewn<br>also in grey) |
| *Lee's Colonel Taylor                                   | Madder's Brilliant                        |
| *Litton's Imperator                                     | *Hepworth's Robin Hood                    |
| *Howard's Lord Nelson                                   | *Moore's Jubilee                          |
| *Ollier's Lady Anne Wil-<br>braham                      | *Yates' Morris Green Hero                 |
| *Pollitt's Ruler of Eng-<br>land                        | *Clough's Dolittle                        |
| *Pollitt's Highland Laddie                              | Clapton Hero                              |
| *Pollitt's Standard of Eng-<br>land                     | *Lightbody's Star of<br>Bethlehem         |
| *Buckley's Jolly Tar                                    | Cockup's Eclipse                          |
| Warris' Blucher                                         | Smith's Waterloo                          |
| *Barlow's King                                          | Lee's Talavera                            |
| Wood's Lord Lascelles                                   | Simpson's Commander                       |
|                                                         | Shakspeare                                |
|                                                         | Gorton's Champion                         |
|                                                         | *Ashton's Prince of Wales                 |

**GREY-EDGED.**

|                                      |                                             |
|--------------------------------------|---------------------------------------------|
| *Grime's Privateer                   | *Kent's Queen Victoria                      |
| *Waterhouse's Conqueror<br>of Europe | Lightbody's Conciliation<br>————— Candidate |
| *Kenyon's Ringleader                 | Smith's General Bolivar                     |
| *Cheetham's Lancashire<br>Hero       | Page's Duchess of Olden-<br>burg            |
| *Warris' Union                       | *Ashworth's Newton Hero                     |
| *Fletcher's Ne Plus Ultra            | *Thompson's Bang-up                         |
| *Fletcher's Mary Ann                 | Scholes' Mango                              |
| *Syke's Complete                     | *Metcalf's Lancashire<br>Hero               |
| *Taylor's Ploughboy                  | Rider's Junius                              |
| *Thompson's Revenge                  |                                             |

|                                  |                      |
|----------------------------------|----------------------|
| *Atcherley's Alpine Shep-herdess | Hero of the Nile     |
| *Pearson's Liberty               | *Rider's Waterloo    |
| *Howard's Sweepstakes            | Wild's Highland Lass |

## WHITE-EDGED.

|                                 |                                  |
|---------------------------------|----------------------------------|
| *Taylor's Glory                 | *Kenyon's Lord Chancellor        |
| *Lee's Bright Venus             | *Taylor's Princess Royal         |
| *Popplewell's Conqueror         | *Clegg's Crucifix                |
| *Ashworth's Regular             | *Lee's Earl Grosvenor            |
| *Hughes' Pillar of Beauty       | Scholes' Mrs. Clark              |
| *Pott's Regulator               | ———— Lancashire Lady             |
| *Taylor's Favourite             | *Hepworth's True Briton          |
| *Wood's Delight                 | Wild's Bright Phœbus             |
| *Simpson's Lord of Hal-lamshire | *Hinchliffe's Lily of the Valley |
| *Ashworth's Rule All            | *Mellor's Reform                 |
| *Cheetham's Countess of Wilton  | *Lightbody's Fair Flora          |
| Campbell's Robert Burns         | *———— Fair Maid                  |

## SELFS

Are of one plain unshaded colour, with the paste round the tube white.

|                           |                                  |
|---------------------------|----------------------------------|
| *Redmayn's Metropolitan   | *Hufton's Squire Mundy           |
| *Berry's Lord Primate     | <i>alias</i> Faulkner's Hannibal |
| *Netherwood's Othello     | *Gorton's Grand Turk             |
| *Grime's Flora's Flag     | *Gorton's Stadtholder (yellow)   |
| *Whittaker's True Blue    | *Gorton's Goldfinch (do.)        |
| *Scholes' Ned Lud         | *Ray's Jupiter                   |
| *Findley's Purple of Tyre | Smiling Beauty                   |
| *Kenyon's Freedom         | Ivanhoe                          |
| Sim's Jessie              | *Clegg's Blue Bonnet             |
| *Bradshaw's Tidy          |                                  |
| *Oddie's Rest             |                                  |

## ALPINES

Have the outer petals shaded by a mixture of two colours, not separated into distinct bands of colour, as in the edged varieties ; and the paste round the tube is yellow instead of white, as in the edged and selfs.

|                         |                      |
|-------------------------|----------------------|
| Emmerson's Favourite    | Kettleby's True Blue |
| Fieldhouse's Fair Rosa- | Margaret             |
| mond                    | President            |
| King of the Alps        | Victoria             |
| Queen Victoria          | Village Maid         |
| Conspicua               | Miss Fieldhouse      |
| Rising Sun              | Captain Frazer       |
| Fair Helen              |                      |

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CHARACTERISTICS OF EXCELLENCE.

As florists have several terms relative to the Auricula which may be not understood by every amateur, we may as well here explain that the *thrum* is a collective name for the parts of fructification in the very centre or *tube* of each flower. *Paste* is the white colour next round the tube or *eye* of the flower. *Ground colour* is the next colour to this on the petal, being the distinctive colour of the variety. *Edge* is the outer colour of all, forming the border of the flower. A *Pip* is a single flower, and a *Truss* is several pips, with their several footstalks springing from one stem common to them all.



Upon the beauty of the form, and just association in the colours and proportions of the above parts of the Auricula's inflorescence, florists found their judgment as to either the excellence or inferiority of varieties, and of these the edged are universally considered the best. Mr. Emmerton was the first to have enlarged and correct opinions upon these points; others corrected where he had slightly erred, and the collective judgment of the floricultural world, with some judicious emendations by Mr. Glemny, were arranged and published by him as a code. With some slight additions it was as follows:—

The properties of the Auricula may be divided into two series; namely, those of the single pip, and those of the single plant.

*The Pip.*—1. Should be round, large, with petals firm, fleshy, smooth at the edges, without notch or serrature, and perfectly flat.

2. The centre or tube should not exceed one-fourth of the diameter of the pip; it should be of a fine yellow or lemon colour, perfectly round, well filled with the anthers or thrum, and the edge rise a trifle above the paste or eye.

3. The paste, or eye, should be perfectly circular, smooth, and a dense pure white,\* without crack or blemish, forming a band not less than half the width of the tube, and encircling it.

\* Yellow in the alpines.

4. The ground colour should be dense, whole, and form a perfect circle next the eye; the brighter, darker, or richer the colour, the better the flower; but if it be paler at the edges of the petals (where they are parted into five) or have two colours or shades, it is a fatal defect.

5. The margin or outward edge should be a clear unchangeable green, grey, or white, and be about the same width as the ground colour, which must in no part go through to the edge. From the edge of the paste to the outer edge of the flower should be as wide as from the centre of the tube to the outer edge of the paste.

In other words, the proportions of the flower may be described by drawing four circles round a given point at equal distances; the first circle forming the tube, the second the white eye, the third the ground colour, and the fourth the outer edge of the flower,\* and the nearer they approximate to this (except that the ground colour, and green or grey edge, run into each other in feathery points) the better the flower.

\* Maddock has recorded against himself that he had no correct eye for the beauty of proportions, for he gives as the standard of excellence (supposing the pip to be divided into six equal parts) one to the tube, three to the paste, and two for the ground and edge! The offensive glaring effect of these proportions are fully displayed in the illustration he gives at the end of his *Florist's Directory*.

The colours should not be liable to fly, as is the defect of Stretch's Alexander, the colours of which fade in 3 or 4 days.

*Of the plant.*—1. The stem should be strong, round, upright, elastic, bearing the truss upright without support, and from four to seven inches high, so as to carry the truss well above the leaves.

2. The length and strength of the footstalks of the pips should be so proportioned to the number and size of these that all the pips may have room to show themselves, and to form a close compact truss of flowers, not less than seven in number, without lapping over each other. The pips should be all alike in colour, size and form, so as not to be easily distinguished from one another, for otherwise the unity and harmony of the truss will be destroyed, and although ever so beautifully formed, would appear as if taken from different sorts of Auricula. An Auricula ought to blow freely, and expand all its pips at the same time, for by this means the colours in them all will appear equally fresh and lively ; whereas in those that do not blow some of the pips till others have passed their prime, the whole appearance of the truss is impaired.\* (*Emmerton on the Auricula*, 16.)

\* To remedy this defect, it is usual not to thin the pips too much soon after they appear, so that those which are so forward may be cut away, and the remaining pips will then bloom equally alike.

3. The truss is improved if one or more leaves grow, and stand up well behind the blooms, for it assists the truss, and adds much to the beauty of the blooms by forming a green background.

4. The foliage, or grass, should be healthy, well-grown, and almost cover the pot. (*Gard. and Florist*, i. 45.)

We are of opinion that all these criteria are founded upon the dictates of correct taste; but, as these excellencies are never combined in one variety, and as some, being equals in many qualities, are mutually superior in others, the question constantly arises at Auricula exhibitions, as to which variety has the preponderance of merit. Now, we are clearly of opinion that *form*, including in this the relative proportions of the colours on the pips, the length of the footstalks, the number of pips, &c., is by far the most striking excellence in an Auricula. Next to this we should place the harmony, or, as we should prefer, the agreeable contrast, or complementary association, of the colours. In our estimate of these, and other points of excellence, we agree with an authority, who has embodied his judgment as follows:—

*Form*, including the shape and proportion of the tube, of course takes the precedence, without reference to colour; for, let that be as it may, if the margin of the pips is undulated or frilled (a fault more particularly observable in selfs), or if the seg-

ments of each individual corolla are too wide, or should the flower have a disposition to cup, instead of lying flat and smooth, these are drawbacks which no brilliancy of colouring can counterbalance. Other defects under this head consist in the disposition which some flowers have to crack in the paste towards the tube, which is sometimes the case in Page's Champion ; also when the tube is not perfectly round, and when the anthers or thrum do not fill its cavity, but appear as if they had discharged their pollen, and shrunk to half their size, as in Pearson's Badajoz. Again, injuries which the corolla or pip may have received from a chafe or bruise, also detract from form ; and, in judging the merits of the respective flowers, this would be considered a serious defect, though by no means lowering the value of the plant, as this drawback is either caused by accident or the carelessness of the exhibitor.

*Harmony*, or the proper distribution of the colours. Judges, on taking into consideration the proportions of colour, will, of course, attach the greatest merit to those pips where the eye or paste, the dark or body-colour, and the edge of green, grey, or white, are distributed in the most equal proportions ; that is to say, the nearer the distance between the tube and inner margin of the dark band approximates in width to the band itself, and the margin likewise, the better are the proportions.

*Defects.*—Under this head may be pointed out such flowers as Cockup's Eclipse, Howard's Nelson, and Taylor's Ploughboy, where the dark ground is too large in comparison with the other parts; or Politt's Standard of England, where it is often too small; and the Pillar of Beauty, in which the body-colour occasionally strikes through to the outer edge.

*Colour*, having depth or intensity, must always have the preference (other points being equal) to that of dull appearance. The purer the white, the darker the body-colour, and the more distinct the margin, the greater will be the merit of the flower; and the censors ought to bear in mind that these colours should be vividly and clearly portrayed. The agreeableness of the contrasts, or complemental association of the colours of the edge, the ground, and the paste, are also deserving of great consideration. A Lancashire flower, called Galloway's Glory of Oldham, has a foxy tinge between the eye and ground-colour, which is a serious defect. Stretch's Alexander is apt to become a pea-green on the margin, after being expanded a day or two, so that a truss of this variety will often have a very motley appearance. Sometimes flowers will be placed for judging with the pounce from the eye, or that of the margin, of grey or white varieties, smeared over the ground or body-colour: this fault cannot be overlooked.

*Uniformity* is the fourth requisite, for, whether the

pips forming the head are small, medium, or large, they ought to be as near as possible equal in size, as in the accompanying woodcut, which shews a perfect



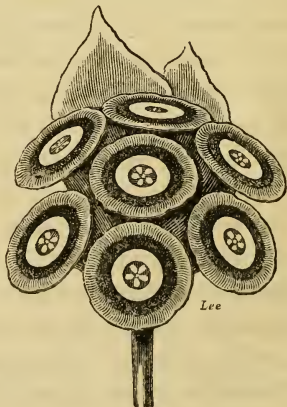
truss. Nothing looks more awkward than to have some of the pips twice the size of others, or to have some expanded three or four days, or a week, whilst others are comparatively buds. A fine contour (if we may so express it) is indispensable for a first-rate truss.

*Size* may be the fifth point for judges to consider. Generally speaking, moderately grown pips 'come' (in florists' phraseology) the truest and best ; but, of course, a large flower will always be preferred to a small one, the other properties being equal.

*Mode of Exhibition.*—They are usually exhibited



in the pots in which they have been bloomed. The strength of an unsupported stem, like that in the woodcut, as an evidence of good management, is, by this means, apparent, but cannot be appreciated when shewn in bottles, which is often done in the midland counties. Another desideratum (which, though absent, is not absolutely a defect) is, a single leaf immediately behind the truss : this gives it a neat and finished appearance, similar to the sprigs of green at the back of a bouquet. The number of pips necessary to form a head for competition varies much in different localities. In the north they are exhibited from three to nine ; in London and the neighbourhood, seven are considered requisite. Not less than five, however, ought to be allowed (except in the case





of the first season of seedlings, when the minimum might be three), and as many more as can be symmetrically arranged, that have the required properties. Selves, or Auriculas with only one colour besides the eye, are judged on the same principle as regards form, colour, uniformity, and size ; with this exception, that as in some sorts the eye is small, in comparison with the blue, purple, or dark ground-colour, a slight variation is required, under the head of “ harmony ;” and the paste, or eye, ought to be one-half the width of the tube—larger in self-coloured Auriculas than in those which are edged. Alpines, or Auriculas with yellow centres and shaded margins, are judged by the same standard as above. They are not, however, often exhibited, or grown in collections, as it is next to impossible to save good seed where they are cultivated. (*Gard. Chron.* 1845, 256.)

In deciding on the relative merits of flowers, it is a good plan to give to form, including rotundity and flatness of the corolla, &c., five points ; to harmony, or a just distribution of colour, four points ; to intensity (including just association) of colouring, three points ; to uniformity, or proportions of the truss, two points : and to size, one point. Suppose, by way of illustration, that the two heads of competing flowers are trusses of Lee’s Colonel Taylor, green edge ; No. 1, with seven pips, from rather a weakly plant ; No. 2, with five, rather larger. In form and

colour, suppose they are acknowledged to be equal ; but No. 1 has two of the pips in which the ground or dark colour has struck through to the outer edge, still it is most uniform. There would then, in this case, be only three properties to decide on : distribution of colour or harmony, uniformity, and size ; and the decision would stand thus :—

|             |   |   |   |       |
|-------------|---|---|---|-------|
| No. 1.—Form | . | . | . | equal |
| Harmony     | . | . | . |       |
| Intensity   | . | . | . | equal |
| Uniformity  | . | . | . | 3     |
| Size        | . | . | . |       |
|             |   |   |   | <hr/> |
|             |   |   |   | 3     |
|             |   |   |   | <hr/> |

|             |   |   |   |       |
|-------------|---|---|---|-------|
| No. 2.—Form | . | . | . | equal |
| Harmony     | . | . | . | 4     |
| Intensity   | . | . | . | equal |
| Uniformity  | . | . | . |       |
| Size        | . | . | . | 1     |
|             |   |   |   | <hr/> |
|             |   |   |   | 5     |

No. 2 would thus be awarded the first place, winning by two points.

Again, of Colonel Taylor, *v.* Galloway's Glory of Oldham :—

The former would be best in—

|              |   |   |   |       |
|--------------|---|---|---|-------|
| Form         | . | . | . | 5     |
| Distribution | . | . | . | 4     |
| Colour       | . | . | . | 3     |
|              |   |   |   | <hr/> |
|              |   |   |   | 12    |

The latter best in—

|                    |       |
|--------------------|-------|
| Uniformity . . . . | 2     |
| Size . . . .       | 1     |
|                    | <hr/> |
|                    | 3     |
|                    | <hr/> |

Again, we will suppose other two flowers. No 1, best in form and colour ; which would be 5 and 3=8. No. 2, best in distribution, uniformity, and size ; which would reckon 4, 2, 1=7. No. 2 would thus lose by one point.

Another example will be sufficient to show the working of this method. No. 1, best harmony or distribution, and most intense in colour, would be 4 and 3,=7. No. 2, best form, uniformity of truss and size, 5, 2, 1=8. No. 2 winning by one point. (*Ibid.* 272.)

#### EXHIBITING.

In different localities various systems of exhibiting the Auricula are in practice. In the south it is usual to shew in pairs—a green and grey, or white edge, for instance. In other parts of the country, pairs of four, consisting of the above varieties, with a self-coloured one added, are brought in competition : to those, some societies add an Alpine. Others, again, shew entirely in classes, the flowers being placed first, second, third, &c., according to their respective merits in each colour. These various systems of exhibiting are of course mere matters of taste or convenience.

If exhibited in Paris, the following additional desiderata should be kept in remembrance by the judges.

*Of the Pair.*—1. The pair should be of equal height and size, both in truss and foliage. 2. The colours of the flowers should be as much contrasted as possible, a green edge and a grey one, a dark ground and a bright one, a dark green edge and a light green edge, or any other contrast in the colour, would be a point over equally good flowers not so contrasted. (*Gard. and Flor.* i. 45.)

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## MODES OF PROPAGATION.

WE once saw an emission of roots from the lower end of an Auricula leaf which justifies the opinion that, like most fleshy-leaved plants, it might be increased by that means, but we have never tested this experimentally.\* The only mode of propagating established varieties of the Auricula, practised by florists, is by slips from, and divisions, of their roots. New varieties are raised from seed.

*By slips and root-division.*—The best time for thus propagating the Auricula is during the last half of February, though it is quite true, as stated by

\* A florist near Middleton, raised a plant of Lees Col. Taylor by this means, which has bred and bloomed the same as any other plant of the same variety.

Emmerton, that it may be done at any time from February to August. Hogg, when he first wrote on the *Auricula*, was in favour of planting slips in August, but, in his "Supplement," published thirteen years subsequently, he recommends all offsets to be removed from the parent plants in March, because they grow quickest in spring. This season is now almost universally adopted for propagating by slips, and the course of proceeding has been thus succinctly stated by Mr. Groom, florist, of Clapham :

The best time for propagating is the month of February, taking the offsets and potting them (if strong), one in a three-inch pot, or, if small, four or five in the same sized pot ; the most suitable soil is a mixture of one half loam, laid up for three years, one fourth top spit of a rich meadow, and one fourth rotten dung, five years old. The situation should be south or south-east, on a dry bottom, and the plants set near the glass, shaded from the sun when powerful, as they get forward for bloom. (*Gard. Journ.* 1846, 200.)

For the following more copious directions we are indebted to Mr. Emmerton :—

The slips are often so situated that, by removing a little of the earth, they may be taken from the mother-plant with the finger and thumb, or with a sharp piece of wood, made for that purpose in the shape of a knife, without taking the plant out of the pot ; this

will do the plant little or no injury, and should be done, if practicable. When the suckers are large, and so united to the mother-plant that it is difficult to separate them and yet to preserve a sufficient quantity of small roots to them ; take the plant out of the pot, and divide the main root, with a sharp knife, into as many parts as there are suckers. This operation, likewise, is the safest for two reasons ; first, because the suckers, being difficult to be severed, will not by that means be so much in danger of spoiling ; and secondly, being thus separated they will certainly bring away more small roots with them than if they were torn off. Sometimes the operation of the knife is not necessary, and yet the offsets cannot be so well separated without taking the old plant out of the pot ; when this happens, and you have slipt off the offsets, trim the fibres of the old plant, and replace it again into its pot ; if this can be done without disturbing many of the roots, the old plant may blow the stronger for it. If there is not above an offset or two, and you want a strong bloom from the mother-plant, take them off without removing the old plant ; if this be not practicable, let it remain till the plant has done blowing ; it will then be time enough to remove the offsets. Plant the offsets, immediately on taking them off, on the side of pots called (about London) upright forty-eights ; they are about four or five inches over at the top, three inches and a half at the bottom, and

four or five inches deep, so that the plants may easily slip out, with all the earth round them. When the offsets have been thus planted, trim the fibres of the mother-plant, and replace it again in its pot, adding a little fresh earth to supply the place of that which is removed in trimming the fibres. Give the plants and offsets a gentle watering and place them in the shade (the warmer the weather, the more shade and water they require.) Be careful not to place them under trees; the water that drops from them, both in showers of rain and afterwards, is very pernicious to all kinds of plants and flowers; the plants thus managed, will be strongly rooted before winter. (*Emmerton's Auricula*, 127.)

*By Seed.*—By this mode new varieties are obtained, and by very careful attention to the selection of the parents, and that no impregnation takes place from undesired plants, very considerable control may be exercised over the qualities obtained to the progeny. This control, however, is very far from being absolute, for grey-edged seedlings will come from green-edged parents, and far more of selfs than any parti-coloured flowers. For this reason Mr. Emmerton is quite right in recommending Auricula fanciers to endeavour to save seed annually sufficient to raise about 400 seedlings, out of which they might succeed in bringing 300 to the condition of healthy blooming plants. From 20 to 24 young plants will produce,



usually, a sufficient quantity of seed, on an average of seven years, to raise annually the quantity named ; but if a heavy crop of seed is obtained, which will be the case some seasons, that number of plants may produce a sufficient quantity of good seed to raise 600 or 700 seedlings ; and, if so, about 450 seedlings will arrive to blooming perfection. Out of 300 seedlings saved on this system, you are at a certainty of raising five superior or first-rate flowers, besides seven or eight (if not more) second-rate flowers. No one should raise seedlings from any sort that cracks in the eye, even if the colours be ever so brilliant, and its other properties perfect. (*Emmerton's Auricula*, 23.)

Make choice of such plants to save seed from as are not more than two or three years old, and healthy ; for, though such plants usually bear but small trusses, their seed pods are as generally large and full. The best proportioned and highest coloured flowers should be saved, and their colours should be true and unchanged to the last ; or, as florists term it, they should “die well.” Most flowers having a ground colour of a dark blue purple die bad, whilst those of a dark red purple commonly die well. Plants with only one stem or truss are to be preferred. All ordinary flowers should be removed to a great distance from those intended for seed, to prevent cross impregnation from them. (*Ibid.* 17 ; *Hogg*, 148.)



Move the breeders early from any winter shelter they may have had, and let them be placed in an open situation, yet shaded from all but the morning sun.

They should be preserved from excessive rain by mats on hoops, or small hand-glasses may be placed over them. In dry weather, let them be regularly watered, either by sprinkling from a brush, or otherwise with a fine rose, as often as they appear to require it. Much depends on a due attention to this particular point. (*Maddock's Florist's Directory*, 127.)

The best time for setting apart the breeding plants is during the two middle weeks of March. Place the breeders in an east aspect (by no means a north as yet), and there leave them to grow and bloom in their natural way. At all events, never suffer flowers intended for seed to remain longer in their winter quarters than when they begin to expand their master pips, and never allow them to remain in the frame till they have completely blown. Flowers that are permitted to bloom, and remain under glass any length of time, or that are placed on a stage, will seldom produce bold strong seed. Large strong plants, that are bloomed very fine under glass, and afterwards are placed on a stage, seldom or never have a perfect, sound seed; the pods will apparently thrive, and swell to a large size, but when you open

them in the sowing season the seed turns out to be delicate, thin, and weak. Cut out the centre weak pips early, which strengthens the other pips, and promotes the production of seed. So soon as the petals have faded remove any that may still cling round the seed vessels, for they retain moisture, often injuring them, and checking the ripening of the seed. (*Emmerton*, 44; *Hogg*, 139.)

The seed will ripen in July, and the ripeness is known by the pods turning brown, and beginning to open. Look over the plants daily, and gather the pods as they ripen, lest the seed be shaken out by the wind or other accident. The whole truss will not ripen together, therefore cut off each pod as it grows ripe, put it in a thin white paper bag, and place it in a window in the sun for two or three days to harden, and prevent its growing mouldy. The seed should be kept in the pods as much as possible till the time of sowing. (*Emmerton*, 46.)

*Best Varieties to Breed from.*—There are no class of seedling florist's flowers that sport so much as Auriculas, and to ascertain the cause of this has often puzzled the most experienced growers. Lee's Col. Taylor almost invariably "brings," or produces, Selfs, and others a considerable portion of them Alpines. Few growers have ever been able to raise more than three or four varieties in their lifetime; and Emmerton, Maddock, &c., never raised one that was able to

retain a place in a collection. We knew two Auricula growers, of 50 years' standing, who were annually sowing seed, and yet never raised a good variety, although in other florist's flowers they were successful. In our opinion, this has been owing to taking seed from the very old varieties, which have been only a slight improvement upon the earlier ones; and to be successful, no doubt the more modern the varieties from which the seed is taken, the greater probability of success. We have had a long and interesting conversation upon the subject with a very old grower, and, without any previous communication with each other, we scarcely differed at all on this point. After a careful consideration of their properties, &c., we have selected the following as the best for breeders:—

## GREEN-EDGED.

Litton's Imperator  
Barlow's King  
Yates' Morris Green Hero  
Pollitt's Highland Laddie

## WHITE-EDGED.

Simpson's Lord of Halamshire  
Taylor's Favourite  
Taylor's Glory  
Cheetham's Countess of Wilton

## GREY-EDGED.

Kenyon's Ringleader  
Fletcher's Ne Plus Ultra  
Waterhouse's Conqueror of Europe  
Fletcher's Mary Ann  
Syke's Complete  
Cheetham's Lancashire Hero

## SELFS.

Whittaker's True Blue  
Netherwood's Othello

Cross impregnation might be effected, probably, by cutting off the anthers immediately a pip opens, and

applying the pollen to the pistil by the aid of a camel's-hair brush. A very fine-pointed pair of scissors must be employed, and great care in removing the anthers.

The breeders should be placed in a frame made for the purpose, and having lights to fit it like a cucumber frame. The sides should be a foot and a half broad and one inch thick, and small cross-bars should be fitted within in the form of those for a window-sash. These cross-bars are to support a covering of the finest net, such as is employed for making ladies' caps, which must be nailed tightly over, so as to exclude even a small fly, and thus you will prevent accidental impregnation.

*Sowing*.—If autumn sowing be adopted, we recommend the seed to be sown soon after it is ripe, not later than September. But if, as directed by Hogg and Emmerton, the seed is kept out of the ground until January or February, let it be preserved in the seed vessels, and kept in a cool, not very dry, room. If sowing immediately the seed is ripe be the mode adopted, the system recommended by Mr. P. Cornfield, florist, of Northampton, may be advantageously pursued :—

When the seed is ripe, he prepares the soil to receive it in the following manner :—Sift the soil, which is chiefly of bog and old rotten cowdung ; then sprinkle it, to make it quite moist ; then put some of

it into a shallow tin pan, and place it over a clear fire, till it is as hot as can be borne by the hand. Keep stirring it till it has destroyed any seeds of weeds, or the larvæ of insects ; preparing soil enough to lay it about three or four inches deep from the upper edge or rim of the pots. Then gather the seed-pods, rub the seeds out on a sheet of paper, sow them immediately ; and sift through a very fine sieve just enough of soil to cover the seed, about as thick as a sixpence. Place the pots in a shady situation, or where they can only have the morning sun for an hour or two. Use no frame or glass of any sort till after Christmas, as they will generally bear a good deal of cold till that time. Sow as thick as nearly to cover the surface of the soil. The seedlings will come up plentifully in three weeks or a month, and great numbers of them will be fit to prick out in November or December ; being careful to extract them so as not to disturb the lesser plants. The seed will continue to come up for months after. Although seed a year old will vegetate, yet new seeds make the strongest and most healthy plants. (*Gard. Mag.* vi. 426.)

The time of sowing and treatment of the seedlings recommended by Mr. Emmerton, Mr. Hogg, and Mr. Maddocks, are good, and, our object being to concentrate information, we subjoin their respective recommendations, appending our own observations and

counter experience on a few points. Mr. Emmerton says—

Sow in small pots, about six inches over the top, and about six inches deep, or, what are termed by the potters about London, flat-thirty-twos; the hole at the bottom of the pot should be made larger than usual; after which it should be covered with a hollow oyster-shell, or a piece of tile made to lie hollow, or a piece or two of garden-pot, which will drain off the water from the pots. The pots should be filled about two inches and a half with coal-ashes, or small cinders, about the size of coarse gravel, which will greatly assist in draining off the water, and at the same time prevent the worms getting into the pots, and disturbing or injuring the seedling plants. Fill the pots with the same kind of compost, sifted finely, that was used for the blooming plants, within about half an inch of the top; shake the pot well, to settle the mould, then smooth the earth, and let it be tolerably well pressed with the bottom of an empty pot, or something flat that will fit the top of the pot, then sow the seed very equally, taking care that the wind does not blow any part of it; have some of the earth very finely sifted, and not too dry, which cover over with your hand very regularly, to rather better than the thickness of a shilling, giving it another gentle pressing with the pot, &c., and make the surface quite level. Place the pots in a

situation quite excluded from the sun, except in the morning, placing closely over it a crown glass shade, or what is called a striking glass, so as to fit the inside of the pot; this will cause the seed to vegetate much sooner; and by pouring the water upon the top of the glass, the earth will receive sufficient moisture, so that there will be no occasion to remove it. The front of a greenhouse, or a cool frame, are good places for the seed-pots to be placed in, but by no means a hotbed; or, if not that accommodation, a hand-glass, having tiles or slates placed underneath, to keep the worms out of the pots; great care being taken to keep the earth in a regular moist state. In about four or five weeks—perhaps three weeks—if in a greenhouse, the seeds will break ground; and when the leaf begins to appear, take care, by degrees, to admit air, first by raising the glass a little on one side by a small piece of wood or tile, which can easily be removed when it is found necessary to give the plants water, which should still be done by pouring it over the glass, by which means no risk is incurred of washing up the plants, and every part of the earth will get a sufficient degree of moisture, after which air can again be admitted; and, as the plants advance in size, more air can be given by raising the glass quite level all round, and as they get strength let it be raised higher by degrees; and when they appear with four leaves, it may be entirely removed.



You must then let the plants be exposed to gentle, but by no means to very heavy rains; take care to keep them clear of weeds, and the sooner you do this the better, before the *Auricula* roots spread so as to be liable to be disturbed by weeding. A very little attention will serve to distinguish the young weeds from the seedling plants. When the seedling plants are young, consequently tender, they should be kept entirely from the sun; for when they first appear, an hour's strong sun would destroy the crop; nor should they have the sun during the summer months, after ten or eleven o'clock, even if they are growing strong. The *Auricula* delights in cool shade, under a north wall or pales, &c., but by no means under the droppings of trees, and in the winter season only requires the comfortable and invigorating heat of the sun. As soon as the plants appear with six leaves, they should be carefully pricked out, into pots about five inches over, or what are called about London, forty-eights, filled with the same sort of compost they were sown in, about four or five in a pot. Early in the spring following they should be again removed; the best time is the 1st to the 12th of March; put them singly into small pots, or what are called upright sixties (and there to remain for bloom), which will be of a sufficient size to carry them through the summer, particularly the strong plants; those that are very weak, keep two or three



in a forty-eight pot till another season, as they may not bloom till the third year. (*Emmerton*, 50.)

Mr. Hogg's directions are these :—

Let the seed be sown in pots adapted to the size of your striking or bell-glasses, no matter whether in 32 or 24 sized pots, which are to be filled one inch and a half deep at the bottom with broken oyster-shells, tiles, or small cinders, to ensure a good drainage ; then fill the pots with finely-sifted compost, and smooth the top of it with a flat smooth board, made round to fit the inside of the pot ; let the compost be fullest in the middle, gradually falling to the sides of the pot. Then sow the seed as regularly as you possibly can, and cover it, as nearly as you can guess, with fine mould passed through a sieve to the thickness of a shilling ; take a clothes or other soft brush and dip it into soft water, giving it a shake to throw off the heavy weight of the water, then either shake it over the seed, or draw your hand along the hair, and it will fall like a dew upon it ; repeat this till you perceive the compost to be well moistened. By watering in this manner you will not be liable to disturb or wash out the seed. You may then put on the bell-glasses, or if you have not these, you may cover the seed with squares of window-glass, resting on the tops of the pots, which, in the opinion of many, answer full as well, if not better. Place the pots in pans or saucers in the front of a greenhouse, or the window

of a dwelling-house close to the glass, where they will have the benefit of the sun, and keep the saucers well supplied with water, so as to render top watering less frequent and necessary. If you perceive at any time a little mouldiness on the surface of the mould arising from the confined damp, take off the glasses for a day, and let them be wiped dry before you replace them. The seedlings will make their appearance in a month, but sometimes not in less than six weeks. When the seed is up, take away the striking glasses, and place squares of window glass over the pots in their stead, for you must be careful not to confine the seedlings too long, and so draw them up weak, as you would mustard and cress. Give air gradually, and harden them to it by degrees. The young plants, when beginning to sprout, will sometimes throw their roots out of ground, which must be carefully put in again, by making a small cleft in the earth, and closing the soil round them; this may be done with a long flat bit of ivory or smooth wood, thin at the end, and about one-eighth of an inch broad. As soon as the plants are fit to handle, transplant them carefully into store pans or pots, an inch apart, filled with proper compost, which ought to be raised in a convex form, one inch and a half higher in the middle than at the sides; water with the brush as before, and place the flat window-glass over the tops of the pots, for a week or two longer,

shading them from the sun in the middle of the day. Water as often as you see occasion. If your plants thrive and do well, in a month or five weeks more you may transplant them a second time into fresh compost, which will very much encourage their growth, where they may remain till August, when you may plant them singly in 60-cast pots, or put three round the edge of a 48, for next spring bloom. Do not overcharge the saucers with water; the mould, if over watered on the top, while the bottoms of the pots are standing in the water, imbibes too much moisture; and the seed will often not only rot, but the young plants will be liable to damp off also. The seed never vegetates freely in very wet mould; yet it should be kept moderately moist. The other sowing may be made towards the middle of February, or the beginning of March; which, being less liable to be checked by frost and cold, will often produce a better crop, and be attended with less trouble than the former; though it would be too much to expect, that any of the plants, raised at this later period, will flower the following spring; the seed may be sown in pots, with glasses to fit inside of the rim, or in open pans, which may be placed in a frame filled with tan; for a very little moderate heat, to keep up the temperature by night, for two or three weeks, will make the seed vegetate sooner; if the weather should prove mild, with occasional sunshine,

you may expect to see the seed break ground early in April. (*Hogg's Supplement*, 172.)

Mr. Maddock says :—

The seed should remain in the pericarpium, or seed-vessel, in a dry room, till sown in January or February. A hotbed, with frames and glass lights, similar to those made use of for cucumbers and melons, being in readiness, provide a box, or boxes, about five or six inches deep, fill them with compost, and gently shake or strike them against the ground, till the earth settles a little; make the surface perfectly smooth, and sow the seed with the utmost regularity; then sift upon it, through a fine wired sieve, a little compost, or decayed willow mould, sufficient only just to cover the seed, and place the box in the frame on the surface of the hotbed; the glasses must be placed over it, and so managed as to preserve a moderate and equal degree of warmth, both day and night, but the glasses must be occasionally opened, or raised at the higher end, to admit fresh air, and to suffer the exhalations from the bed to escape, which is a very essential point. The superior advantage this has over the common methods of raising the seed, is, that it forces every live grain into vegetation in about three weeks, if the warmth of the bed is properly kept up; whereas, by the more usual mode of exposure to the open air, the greater part does not vegetate till the second year; and the weaker

seeds, which are probably the most valuable, seldom vegetate at all. The earth and seed must always be kept moderately moist, but never very wet ; the best method of watering it, is by means of a hard clothes-brush, dipped into soft water, which has had its chill taken off by standing in the sun ; the hair side being quickly turned upwards, and the hand rubbed briskly over it, will cause the water to fly off in an opposite direction, in particles almost as fine as dew ; a sufficient watering may in this manner be given in a few minutes.\* If it is found impossible to preserve the heat of the first bed till the seed has all vegetated, it will be proper to remove the box to a second, prepared in the same manner, which will infallibly answer the purpose with proper management : if the surface of the earth in the box is inclining to become mossy or mouldy, it must be stirred all over very carefully with a pin, about as deep as the thickness of a shilling. At the expiration of three, four, or, at most, five weeks, the young plants will all make their appearance ; it then becomes necessary to give them, very gradually, more air ; in

\* It is a good plan to put some fresh clean moss over the seed when sown ; this keeps the surface more equally moist, and insures its rapid and certain germination. This moss must be removed as soon as the seedlings are fairly above ground, for as they do not by any means require heat, so are they rather impatient of moisture. (*Gard. Chron.* 1846, 272.)

order to harden and render them fit for an entire exposure to it, which they will be able to bear in a fortnight or three week afterwards ; at which time the box should be taken out of the frame, and placed in rather a warm situation, though not too much exposed to the sun, till towards the end of April, when it may again be removed to a cooler aspect, where it can only receive the sun till nine o'clock in the morning ; and in May, if the weather is hot, it should be placed in the most cool and airy part of the garden, not neglecting at any time to keep the earth moderately moist ; but at the same time preserving it from violent rains, whenever they occur. As soon as the plants appear with six leaves, such should be taken out from the rest, and transplanted into other boxes, filled with the compest, about an inch and a half, or two inches asunder ; and when they they are again grown, so as nearly to touch each other, they may be again transplanted into larger boxes, or round small pots, at the distance of three or four inches, where they should remain till they blow, which will generally happen the following spring, perhaps before they have acquired any considerable size ; and then such as appear to be possessed of merit should be marked, and the inferior ones destroyed. As soon as the bloom is over, such as have been marked should be taken up, and planted separately in small pots, and be taken the

same care of as a full grown Auricula, till they blow again ; at which time their respective merits and properties may be ascertained with more accuracy. Such weakly plants as are not able to blow the first or second year, ought, nevertheless, to be carefully preserved ; for amongst these, it often happens that the most valuable flowers are found. (*Maddock's Florists' Direc.* 128).

Having given the directions of the principal writers upon the Auricula, it is necessary to point out what we consider to be their defects. There are few advocates for autumnal sowings of seed, as it makes but little progress before the winter sets in, and there is a great risk of the seedlings being cut off. Another palpable error in the systems of the cultivators just quoted is the watering over the foliage of the Auricula seedlings, for more losses arise from this cause than any other. The primitive plan adopted by the most celebrated cultivators in the north is far better adapted to the purpose. They generally take a teapot, and water around the edges of the pots, without even wetting the foliage, both in seedlings and blooming plants. The potting of seedlings into small pots, as mentioned by Emmerton and others, is another very great mistake. We never knew an Auricula grower of any note who either potted his offsets or his seedlings into small pots, but principally into large ones, some even more than a foot in diameter, and around



the edges of the pot. By so doing the quantity of soil which the pot holds keeps much longer moist, and consequently much trouble is avoided in watering; and another advantage gained is, that the plants grow so much quicker, and soon become blooming plants, when they are planted in pots of the same size as these, and are treated similarly.

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### SOIL AND MANURES.

THE greatest error into which the cultivators of the *Auricula* wandered some thirty years ago was the employment for its growth of highly stimulating manures and composts. No treatment could be more repugnant to its natural habits, and the usual results of over-excitement were the consequence—too much luxuriance of foliage—deficiency and uncertainty of bloom—canker and, its speedy consequence, death. So precarious did the successful culture of the *Auricula* become under such treatment, that it was gradually being neglected, until Mr. Hogg, Dr. Horner, and others, restored to it the attention it deserved, by adopting a more natural soil and nourishment, and thereby rendering it a more certain reward for the florist's care.

The compost in most general use among *Auricula*



growers is, fresh loamy soil, and perfectly decomposed cow-dung, equal parts of each, adding one-tenth of sea or river sand. Some use leaf-mould instead of cow-dung. The whole incorporated and prepared for one summer and one winter, before required for potting, in the usual manner.

The finest Auriculas we ever saw were potted in equal parts of good turfy loam, leaf-mould, cow-dung, and sand, and frequently watered with manure-water from cow-dung.

Dr. Horner, who was one of our best modern cultivators of the Auricula, used a compost of two parts pasture sods, two years old ; one part cow-dung, three years old ; and half a part coarse river-sand, with the use of decayed leaves, as will be explained in potting. Good, rich, loamy soil, from an old pasture, and old frame dung, will be good substitutes for sods and cow manure, and should be used in the same proportions. All hot, stimulating manures must be carefully avoided. (*Gard. Chron.* 1841, 397.)

Mr. Dickson, well known in the neighbourhood of London as a successful grower of the Auricula, uses a soil composed of one-third Norwood loam, one-third peat and leaf-mould in equal quantities, and one-third rotten dung. (*Gard. Chron.* 1842, 283.)

The father of Mr. Slater, one of the editors of this volume, some 22 years ago, grew about 200 pots for his own amusement, and he invariably used de-

cayed horse-dung, maiden soil, in equal proportions, to which he added some coarse river sand; and this succeeded very well. An Auricula grower at Prestwich, a few miles from Manchester, who, at the time of his death, had been a cultivator of this flower for nearly 60 years, with very remarkable success, employed a compost thus constituted:—1 peck of rushes (green) cut into small pieces not longer than 1 inch; 1 ditto cow-dung and 2 ditto horse-dung, not fresh, but old; 1 ditto meadow soil;  $\frac{1}{2}$  peck of bog or peat earth;  $\frac{1}{2}$  ditto coarse sand; mixed at least three months before used. That rushes, cut small and mixed with all composts, is generally admitted to be good by the practice of using them so general in Lancashire. They appear to be beneficial from two causes, viz., they keep the compost light, so that the air can penetrate it, and they facilitate the drainage. It is highly probable, also, that the rush may contain saline matters that are peculiarly acceptable to the Auricula. Rushes have a large amount of such saline constituents, and some of them are quite peculiar, such as the salts formed with equisetetic acid, in the common horse-tail of our rivers (*Equisetum fluviale*). But besides these, there are in all rushes several salts of potash and lime.

Either of the foregoing, but especially Dr. Horner's compost, we consider admirably suited to the growth of the Auricula, but as our object is to concentrate in

these pages all the knowledge we can obtain upon each subject, we subjoin a detail of the composts used by the three florists who wrote upon the culture about a quarter of a century now passed. We warn our readers that all these composts are too stimulating,—Mr. Maddock's the least so, and Mr. Emmerton's being the most objectionable.

The compost recommended by Mr. Maddock consists of the following ingredients:—1-half rotten dung, two years old; 1-6th fresh sound earth, of an open texture; 1-8th earth of rotten leaves; 1-12th coarse sea or river sand; 1-24th soft decayed willow-wood; 1-24th peaty or moory earth; 1-24th ashes of burnt vegetables. In order to procure the last article with very little trouble, any weeds, sticks, straw, or old mats, that are of no other value, may be collected together in a heap, and consumed by fire in the open air, till their ashes become white; they will contain a small portion of alkaline salts, and should be spread upon the surface of the other ingredients. The compost is to be placed in an open situation, perfectly exposed to the action of both air and sun, from the influence of which it will derive great benefit: it should be turned over once or twice, and as often pass through a coarse screen, or sieve, that it may be well mixed and incorporated; it should then be laid in a regular heap, or mass, from 15 to 18 inches thick, but not more; in this state it may remain a year be-

fore it is made use of, during which period it will be proper to turn it over two or three times, in order to expose all its parts to the atmosphere. Composts should always be kept free from weeds. (*Maddock's Flor. Direct.* 93.)

The compost generally employed, and mostly made use of by Mr. Hogg, was, 1-3rd fresh yellow loam, or maiden mould ; 1-3rd cow-dung, well rotten ; 1-3rd night-soil, two years old ; 1-3rd leaf-mould ; 1-10th sea or river sand ; to be well prepared and incorporated. Auriculas, he says, grow very well in this mixture, but adds, that they should be top-dressed about six weeks before they come into bloom with a compost of a stronger and more active manure. Emmerton's compost of goose-dung and blood, night-soil, loam, and sugar-baker's scum, of each one-third, is well calculated for top-dressing in February. Whoever grows Auriculas in low situations will, perhaps, do well to use old frame-dung instead of cow-dung, because it dries sooner than cow-dung, which is better calculated for elevated situations. The circulation of air is always brisker on the hills than in vales ; and, besides, Mr. Hogg attributed the rot, which in most summers and autumns very frequently attacks the Auricula, to too great a portion of cow-dung in the compost. Where a large stud of Auriculas (to use a Yorkshire term) is kept, it seldom happens that the same sort of compost, precisely, is

made use of two years together ; this was very often Mr. Hogg's case ; he frequently, as opportunities occurred, deposited in the same heap, sheep, horses, cows, poultry, pigeons, night-soil, and blood from the slaughter-house, and turning and mixing the whole up together. He recommends the following compost for strong blooming plants, and says it will retain its virtue for a length of time :—1 barrow of sound staple loam, 1 ditto dried night-soil, 1 ditto dung of sheep, cows, and poultry, mixed in blood from the slaughter-house, in equal quantities,  $\frac{1}{4}$  ditto sea or river sand ; which will be fit for use in no case under two years. (*Hogg's Auricula*, 127.)

Mr. Emmerton's chief compost, for he multiplied them most needlessly, and made them all far too rich, is as follows :—3 barrowsful of goose-dung, steeped in bullock's-blood, 3 ditto sugar-baker's scum, 2 ditto fine yellow loam.

If, says Mr. Emmerton, your mould contains any grubs, insects, or worms, add a peck of quicklime ; that made from stone lime is preferable, as it contains less of magnesia ; lime not only will destroy them, but will hasten putrefaction, and make the compost sooner fit for use ; and if you wish to force the compost still more, spread it about four inches thick in the hot months of June, July, and August, and rake it over frequently, that it may become finely pulverised by being exposed to the sun and air, which will sweeten

it, and extract all its noxious qualities ; and if your compost is even completely rotten, and two years old, still, before you use it, lay it thin as before mentioned for a week or ten days, raking it once a day or oftener, as it is not worth while to run a risk of losing a single plant that is scarce and valuable, by not having the compost perfectly sweet and wholesome ; for he says he had observed that mould, if it is laid in a heap any time, will create an acidity which is prejudicial to plants in general, and which can be only removed by being spread thin, and turned frequently, before potting. (*Emmerton*, 64.)

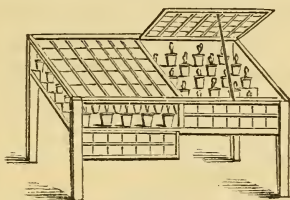
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## GENERAL CULTURE FOR BLOOMING.

THE treatment of the superior varieties of the *Auricula*, solely for the sake of their bloom, may be advantageously considered in three separate subsections, the attention they require being very different at their three annual periods of life.

1. *The Winter, or period of rest.*—The objects to be attained at this time of their cultivation, is freedom from excessive wet, protection from intense frosts, and the admission of air freely. This period extends from the close of October, or beginning of November, accordingly as the severity of the season may begin, early or late, to the end of Jannary. The late Dr.

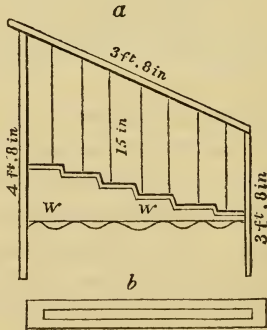
Horner, of Hull, one of the most successful cultivators of the *Auricula*, recommends, for its winter residence, a frame, specially constructed for the purpose, and there is no doubt but that it is the best that has hitherto been proposed for the purpose. It facilitates the admission of light and air, can be easily covered during severe weather, and permits the ready performance of any requisite watering, or other treatment. The following is a front view :—



It stands on legs between two and three feet high ; the top lights slide, and, as shown in the diagram, may also be propped up by means of an iron bar, perforated with holes two or three inches apart ; and which catch on a nail projecting from the wood on which the light rests when down. It is permanently fixed to the sash by means of a small staple, forming a moveable joint, and when not used lies along its lower edge, and is there secured. The front lights let down on hinges ; the ends are also glass ; and in the back, which is wood, there is a door for the convenience of getting to the pots behind, and also for



thorough ventilation. There are five rows of shelves, graduated to the slope of the glass; they have a piece an inch wide sawn out of the middle; there is a space also left between them; so that the bottom of the frame is quite open, for the abundant admission of air to circulate thoroughly around the sides and bottom of the pots. By letting down the front light only, the plants may be left for days together, exposed to all the advantages of light and air, without care or notice, and when it is desirable to give them the benefit of a shower remove the top lights. The following is an end view of the frame, which, by



measurement, is 4 ft. 8 in. at the back; 3 ft. 8 in. in front; 3 ft. 8 in. in depth, from front to back; and 15 in. from the shelves to the glass top light: the rise between the shelves is two inches, and the whole



length of the frame (two lights) is 7 ft. 2 in. The shelves are made 5 in. in breadth, with about an inch sawn out of the middle, the whole length, simply that the pots may not stand in wet or damp; the air thus also permeates the crocks inside the pot; this is important. *ww* is simply a skirting-board of strong deal, partly for ornament round the frame, and in part for strength, and for breaking the wind from blowing, maybe too roughly, in eddies, among the pots; the top lights slide, or may be pulled down in front, as the lights of a green house, &c. The shelves are supported midway by a rest, as at the ends. Fig. *a* is a vertical section of the frame; *b* is a shelf, with an inch sawn out of the middle. (*Gard. Chron.* 1841, 550.)

Dr. Horner recommends that the Auriculas should be placed in the frame early in November, giving them all the air possible, as by letting down the front lights and opening the door behind—the top lights being kept on in case of rain. Watering must be gradually withdrawn, so that during December and January the soil be just kept from being absolutely dry; if it be kept wet or damp, the plants will be in great danger of contracting disease, and of suffering from frost. In winter, during intense frost, the frame must be protected with efficient covering; two stout blankets, with an outer coverlet of tarpauling, are the best, and, in the end, the cheapest materials. If not

protected from severe frost, many of the flower-stems will be found dead, or with only two or three pips at the blooming time. In winter, during milder days, the plants should have sufficient air.

Mr. Emmerton used to move his plants into their winter abode somewhat earlier than Dr. Horner, and used small common cucumber frames instead of a particular structure. These will do, but require much more care. He recommends the frames to be about three-and-a-half or four feet long, and each light about three feet wide, as being most easily managed, and that the plants be put into them about the middle of October. The frames to face the south.

Some growers keep their pots during the winter months plunged in sawdust or ashes, but the greater number keep them surrounded by air. The former mode is safest in very severe winters, as it greatly protects the roots from frost. (*Maddock's Florist's Dir.* 116.)

During the autumn and winter months, even down to the 5th of April or thereabouts, expose them, during the day, to as much air as possible, by having the lights entirely off (except in rainy weather), and then have the frames raised on bricks; for, during the months of November and December, it is necessary they should be kept very dry, and more so in December, as in case of a severe frost the weather has then less power on the roots of the plants. During rain

the lights should be kept over the flowers, but by no means close shut down, but admit all the air you conveniently can behind, as the Auricula itself is quite as hardy, or nearly so, as the common Primrose, but they cannot stand the heavy autumn and winter rains, the greatest enemy this plant has. Towards four o'clock in the afternoon the lights should be pulled over the flowers at this season, and shut close down, with about two or three mats thrown over them, and so to remain till about eight or nine o'clock next morning, when, if it does not rain, snow, or hail, they should be exposed again to the open air in the usual way; but if it rains, take off the mats only. In January, if the season has the appearance of open weather, you may treat your plants nearly in the same manner as the two last months, but if there is snow, and the frost severe, you must be rather more cautious as to the exposure; a trifling frost is of no serious consequence to these hardy plants, but do not have the mould severely frozen in the pots, as by the end of January the bloom is formed, although very low in the heart of the plant, and to get them severely frozen would be risking too much. But if there is likely to be a continuation of frosty weather, and the plants have been close shut down for three weeks, let the snow be taken off the mats, and the lights removed for a few hours in the day, or give plenty of air behind, and if the sun should break out for two

hours, by all means let them enjoy it. At this season cover well up as early as three o'clock in the afternoon, and in January, if severe weather, add an extra mat or two. If the weather has become mild and open about the 18th or 21st of January, your *Auricula* plants at this time ought to be very dry ; if that be the case, you may give them some water, or allow them to have three hours' moderate rain, provided it comes from the south-west, and let it be repeated every opportunity till the mould has got moderately moist. (*Emmerton*, 81.)

Mr. Hogg's directions for admitting air, &c., if common frames are used, are very judicious. He says:— Let the frames be raised on a few bricks, to admit a free current of air under them, and so let them continue as long as the weather is open and temperate. As soon as the frost sets in, remove the bricks, and let the frame rest on the ground. Let the pots be set on four inches deep of coal-ashes, and be kept rather dry than otherwise till February, receiving the water you give them through the small pipe of a water-pot ; be careful also not to let the water run into the heart of the plant, and contrive to give it them when the air is mild, and the wind southward. If the surface mould in the pots becomes incrustated, stir it slightly with an iron skewer or other pointed implement. Remove decayed leaves as they appear.

*Watering in Winter.*—When the plants are first placed in frames, and for about a month after, continue to water to nearly the extent of the summer supply, that the previous repotting may have its full effect on the plant. This is a point of the first consequence, and so treated, with the extra warmth of the sun (for always select a southern aspect for wintering), they become thoroughly re-established in the pots, and form a new set of leaves, before the severe weather occurs. When this new growth is complete, which it usually is by November, the supply of water is reduced to a small quantity, applied about twice a week, just so much as will keep the soil moderately moist; and this is continued through the damp weather usual to this part of the year, until the arrival of clear frosty nights: then it is that the error of keeping the soil dry becomes apparent, for it will be found that, after three or four days' freezing, it is as perfectly incapable of supporting the plants as though it had been exposed for the same period to the effects of a summer's sun. To avoid this, let the Auricula grower give, unhesitatingly, a full watering whenever a favourable opportunity occurs in such weather, so that the soil may hold plenty of moisture when likely to be frozen hard. It may be said, the presence of extra water will but increase the intensity of the frost; but the plants are sufferers to a much greater amount, when,

from the dryness of the earth, the moisture of their systems is absorbed. (*Flor. Journ.* 258).

#### FEBRUARY.

At the close of this month, or very early in March, accordingly as the season is forward or late, the pots of plants for blooming must be dressed. So soon as the weather appears settled for a succession of mild days, carefully take as much earth out of the top of the pots as you can, without disturbing the roots, and put in fresh compost, formed of two parts cow-dung and one part light loam. Be careful not to fill the pots too full with this fresh compost, but leave at least half an inch from the tops empty, that the waterings may sink to the roots, and not run over the edges; by doing this you will more easily be able to take off the decayed leaves from around the plants.

A still better plan is adopted by the Lancashire Auricula growers. The soil is raised in the centre, as represented in the following section.



Water is poured round the edges of the pots, and if exposed to heavy rains, the superfluous wet runs to the sides, and more readily passes away.

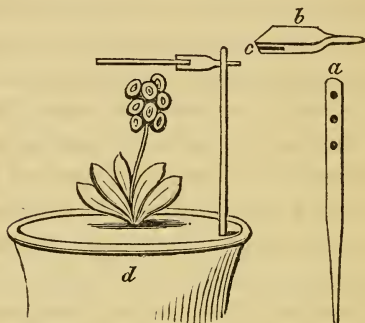
If any plant produces more than one principal stem, pinch off the pips of the smallest and weakest, in order to render the blossoms of that remaining larger and more vigorous. It is a curious fact, that those sorts which are naturally possessed of a fine green on the edge or margin of the flower are often known to lose that property when the stem proceeds from the very heart or centre of the plant; whereas those stems that proceed from the side produce larger pips, possessing their true natural colours in much greater perfection; these last are called the winter stems, because they are usually forwarder, and produce their flowers rather earlier in the season than those which proceed from the centre of the plant.\*

When the pips become turgid and begin to expand, they must be preserved from rain, nor should they remain any longer in a situation exposed to cold winds; but such plants ought to be removed to a sheltered, shady corner, and have small hand-glasses suspended over them in such a manner as to preserve the bloom from rain, &c., and yet admit a free circulation of air. (*Maddock*, 117.)

\* It is a singular fact, that a winter truss of Lee's Colonel Taylor is generally finer for an exhibition than any other, and when caught in time rarely fails to take a first prize.



Another simple mode of preserving the bloom from rain, adopted by the Lancashire growers, will be best understood from the following sketches and references :—



*a* is a lath, about one foot long, perforated with three holes, at intervals of 2 inches. *b*, a flat piece of wood, the broad part about 2 inches square, and with a tapering handle, about 3 inches long, by which it can be fixed into the holes in *a*. A nick, 1 inch deep, is cut with a saw at *c*. In this nick is inserted a plate of glass, 6 inches long and 5 inches wide. When thus put together, and the sharp end of *a* thrust into the soil of the pot, at a proper distance from the flower, it forms a shelter as represented by *d*.

Draw the lights off during the greater part of the day, and give the plants all the air possible, to pre-



vent the stems being drawn up weak, and let them receive all the gentle rains that fall from the middle to the end of March, to encourage and promote their growth; but shut them close at nights, and give extra thick covering to prevent the opening blossoms being nipped by the frost, which will still frequently recur at this season; for whatever petals are touched by frost never become level, nor show their right colours. If there does not occur rain sufficient to reach their roots, at the bottom of the pots, give the plants manured water twice, and do the same again in March, allowing a week between each watering. (*Hogg*, 135.)

Take the offsets out of the small pots with all the earth about them, remove a little of the earth from the top, and place them into larger pots for bloom also: this should be done in open mild weather; and your plants now should be exposed to all the gentle rains in this month, and at the same time carefully defended from frosts and hail storms, that they may produce fresh roots the sooner. (*Emmerton*, 88.)

#### MARCH TO MAY—BLOOMING PERIOD.

The most critical period has now arrived, for, to bloom Auriculas well, too great attention cannot be paid to them at this period for about four or five weeks, to prevent them from being set, or checked by frost. This strict care commences about the 20th of

March, and ends by the 25th of April, or thereabouts. No flower can be considered in full bloom till the pips are expanded; and most likely in Lancashire and Yorkshire they are not so forward by seven or eight days. To draw these flowers up by glass or any other artificial heat is highly injurious. Many florists keep their lights continually over their flowers, day as well as night, from the 1st of January till the 1st of May, and only admit a current of air behind their frames; this is the rock, fatal to bloom, so many split on; it draws up the flower stem, and renders it weak and incapable of producing a bold truss. To bloom an *Auricula* in perfection, it does not require to be continually under glass night and day longer than twenty-four days, or thereabouts, say from the 4th to the 28th of April; you will then find your middle pips expanded, or nearly so, and well adapted to be exhibited on the stage. Be careful during March and April to protect them from snow, sleet, and hail storms. Sometimes the sun has been so powerful by ten or eleven o'clock, about the end of March, as to make it requisite to put the lights over them, and shade them a few hours. However, so soon as an opportunity offers, expose them to the natural air again. In the first week of April, or thereabouts, it is requisite they should have glass completely over them night and day, till they are in full bloom; but during their stay under glass, admit a

proper portion of air behind the lights, and shade them when requisite. This treatment is necessary for ten or twelve days, or until the master, or the top, pips are the size of a full-blown cowslip; much depends now on the state of the atmosphere, but usually a full south aspect is much too sunny, will over hasten the bloom, and fade the colours; should this be the case, an immediate removal to a full east aspect is desirable, if the weather will admit, under a wall, or other close fence; place hand-glasses over the plants, and by remaining ten or twelve days, or thereabouts, the earliest blossoms will be in such a state of forwardness by the end of April, as to be fit for removal to a full north aspect on the Auricula stage, or any other shady situation. The mats, &c., should be taken off the glasses about seven; and if it proves sunny, they should be shaded at half-past nine in the morning till about twelve or one, when the sun will be off this aspect. Have the hand-glasses washed inside and out before placing them over the flowers, as dirt and dust injures the blossoms. The plants should be exposed to all rains which may fall in the day from the south and south-west, from the beginning of February till about the first week of April, but more particularly after the blooming plants have been moulded up. As soon as the heavy fall of rain is completely over, shut them up close, and cover them warm. At the beginning of April, when they

have pushed up their flower-stems, they must no longer be exposed to showers of rain, but the soil must to the end of the blooming season be preserved in a moist state. As the pips, if frosted when about to expand, will never bloom flat, the frame must be carefully protected, as first described, every night. In watering the plants great care must be taken to avoid the foliage, and if a drop has accidentally fallen into the crown of the plant, it must be extracted by means of a camel-hair pencil, or decay, probably, will be induced. A small watering-pot, with a spout a foot and a half long, bent at the end, and then contracted to the diameter of a goose-quill, should always be used for the purpose of watering. When the pips are just expanded into bloom, the frame, which has hitherto been exposed to a southern aspect, should be removed into the shade, or what is more feasible, the plants may be placed under hand-glasses, in a calm and shaded part of the garden, with the benefit of two hours morning sun. The pots are not placed on the ground, but on shelves graduated according to the fall of the glass lights: slide doors are made in the front and back of the frame, by which means any quantity of air can be admitted, freely to circulate around the bottom, sides, &c., of the pots and plants; it is most injurious to admit air in the common way, by lifting up the glass lights, as the cold air is thus suffered to blow directly upon the expanding blooms;

hence, the very great advantage of the contrivance just described. As the pips expand, the smallest, least perfect, and over-crowded ones must be carefully thinned out, leaving a truss of five, seven, or nine. When in full bloom, the plants may be removed to any other situation the grower may fancy, as, for example, to a cool, airy greenhouse, where their beauties can be conveniently seen and examined. (*Johnson's Dict. of Modern Gardening.*)

The blossoms must not only be protected from the rains, but also from the mid-day sun, by a covering of calico oiled, or treated with Whitney's composition. Notwithstanding this, you must still shut them up close at night, and even cover them with an additional mat, to prevent the blossoms being checked or injured by the frost. This is the critical time that requires the most particular care. As this flower produces more pips and blossoms than can expand at one time, it is necessary, at the beginning or so of this month, to cut out, with great care, the interior or middle pips, reserving not fewer than seven, nor more than thirteen; they should be taken out two or three at a time, and it requires some taste to perform this operation well, that the blossoms which are left may grow in a regular equidistant form, so that such thinning of the pips shall not appear to have taken place, but that they had naturally grown in that form, and with that number. By thus timely

reducing the quantity of the pips, the rest are enabled to increase greatly in size as well as beauty, room being given to all the pips to expand, and become flat and level. (*Hogg*, 136.)

*Cupping*.—This is the technical name given by florists to the form assumed by pips of the Auricula, when their petals turn up somewhat in the manner of the Cowslip, instead of spreading back and forming a level disk.

Flowers, whose petals are of thick, firm texture, are generally inclined to cup, and when this is the case, they should be exposed for a few hours, during two or three days, in the very face of the sun, under a hand-glass, shaded with a piece of mat or gardener's blue apron. This warm confinement under the glass has the effect of gradually producing a greater expansion of the petals, and of making them pliable, so that with a little care, and a thin piece of smooth wood, you will be enabled to lock the edges of the pips under one another and bring them level.

A piece of smooth ivory, with a hole in it, nearly the size of the pip, if pressed lightly upon the pip, will also help to bring it level.

*Stage*.—That which we have already given, as recommended by Dr. Horner, is intended for this purpose, and there is another recommended by Mr. Henderson, of Delvine, N.B., who says his Auricula frame answers all the purposes of frame, hand-glass,

and stage, used by the English florists ; at least, to make it do so, he has only to erect a screen of matting on poles in front, during the flowering season. A sketch, or plan, of the frame is annexed :—

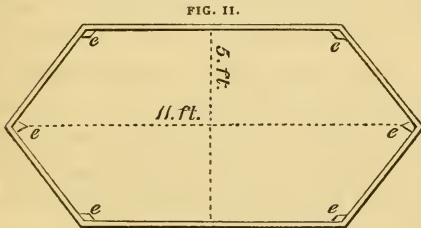
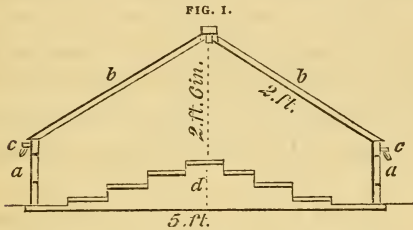


Fig. 1. *a a*, ventilators, of which there are eight ; *b b*, sashes, with hinges at top ; *c c*, handles, two on each side ; *d*, stage, for holding 130 pots.

Fig. 2. *e e*, blocks of wood bolted to the sides to strengthen the corners.

The following is recommended by Mr. Maddock for the summer repository of the Auricula :—Let a bed of coal-ashes be formed in the place where it is intended to be erected, about five or six inches thick ;



or a platform of plain square tiles, closely fitted to each other, on the surface of the ground, to preserve the pots from the common earth worm ; upon this foundation, rows of bricks are to be placed, in straight lines, about two or three inches asunder, which will allow a free circulation of air under and between the pots when placed upon them, an object of great importance, especially in warm weather.

The plants, by the above plan, will be raised from nine to twelve inches above the level of the ashes or platform.

There should be two rows of substantial stakes, three feet long, and five inches by three wide, one row of which should be placed on each side, at about three or four inches from the two outside rows of pots ; these stakes should be driven twenty inches into the ground, with their narrow sides towards the pots, and have notches cut in their tops, to receive the edges of the shutters they are intended to support. By way of illustration, suppose the whole length of the platform to be twelve yards, and the width three feet, it will contain seven rows, and each row about seventy pots, a sufficient number to constitute a moderate collection for a private gentleman. Three shutters, made with feather-edged inch deal boards, each four yards long, and two feet six inches wide, will reach the whole length on one side ; three of the notched stakes will be sufficient to support one of these shutters ; of course 15 stakes at proper dis-



tances will completely answer the purposes on one side : the notches are to be cut in the shape of a V, two inches deep and three inches wide at the top, which will give room for the shutters to move backwards and forwards, without difficulty, or danger of slipping out.

Both sides are thus to be provided with stakes and shutters ; the upper edge of the latter should meet over the centre of the platform, when the plants require to be covered with them, in the form of the ridge or roof of a house, well fitted, and sloping equally on both sides, so as to throw off rain, without even admitting it to drip through upon the plants in any part.

It is necessary that a rail, or row of stakes, of a proper height and length, should proceed from the ground between the two middle rows of pots, to support the shutters when closed or closing, especially as it is usually more convenient to begin to cover or uncover on one side first, and finish on the other : without a support of this kind, in such case, the shutters must fall down upon the plants : a similar exterior rail, or row of stakes, is necessary on each side, to support the shutters when open, with the same degree of slope, in a contrary direction, than when closed ; by which means the plants will have a free communication with the air, whether covered or open ; nor are they entirely deprived of light when

the shutters are closed, because the lower edge of the shutters is as high, or higher, than the top of the plants at all times. The peculiar advantage arising from this plan is, that when the plants require to be shut up from excess of rain, they have at the same time the advantage of a continual supply and free circulation of fresh air, which passes amongst their leaves in all directions; whereas, those who are obliged to shut up their plants in a close frame, to exclude excess of rain from them, oftentimes shut them up in a wet state, as soon as it is judged they have had a sufficiency; this is a very dangerous though not unusual practice, and often produces a mildew, which is attended with the most destructive consequences. /

#### SUMMERING—JUNE TO OCTOBER.

There has been much disputation as to the advisable time for repotting the *Auricula*, which should be done every year without fail. Some florists do not transplant, or repot, as it is termed, until the close of August or early in September; and Mr. Hogg recommends either June, July, or August, for that, if repotted earlier into fresh stimulating earth, this is liable to excite them to bloom in the autumn, which is most destructive to their spring beauty and excellence.\*

\* Potting early in August is to be preferred, if the object in

Our own experience is against this result being produced by early repotting. In the first place there is no need of using a stimulating compost at the time of repotting; and in the second place, the check given to the plants by the transplanting has a decisive tendency to prevent autumn-blooming.

Maddock, Emmerton, and Dr. Horner, all agree in recommending early repotting, and we give the latter's observations without curtailment.

The best time for potting is immediately after the plants have bloomed; for, on account of the long previous confinement in the frame, the frequent waterings, and excitement of blooming, the *Auricula* is very apt to contract disease, especially rot or decay in some part of the main or tap-root. This, in repotting, is at once detected, and consequently the life of the plant saved. Moreover, by early potting, ample time is given for the pot to get well filled with young healthy roots before the approach of winter—the great secret of a vigorous bloom the following spring.

*Neglect of yearly repotting is a great evil.*

*Potting* is thus performed:—1st. Put at the bottom of the pot at least one inch and a half of crocks of broken garden-pots; on these place a thin layer of decayed leaves unbroken up; they prevent the soil

view is to obtain offsets, for the plants make their increase in this mode just after they have done blooming, and potting at that time stops the process.

from filling up the interstices between the crocks, and are acceptable to the roots of the plants.\* Next fill up the pot, within about two inches or so, with the compost, leaving it slightly coned ; put a little sand, and on this place the end of the tap-root, and having disposed the roots regularly over it, let the pot be filled nearly to the brim, so that the soil just covers the base of the lowest leaf. Now strike the pot smartly two or three times on the ground, and then remove it to its summer quarters, having a north or north-east aspect, when water must be given just sufficient to moisten the soil, and repeated at the end of a week, not before. In filling the pot with compost, put in about three fingers full of decayed leaves, not leaf-mould—a pinch here and there. The following year, in repotting, an unusual mass of roots will be found piercing these decayed leaves ; they evidently afford to the plants very acceptable nourishment and drainage. Previously to the operation of potting, the plant must be prepared, by carefully crumbling off the old soil with the fingers, and then washing the roots in water, in order that any decay or disease may be detected, in which case it should be effectually cut out with a sharp knife, and the main root should

\* In Lancashire they very generally use rushes instead of leaves. They are cut into small pieces, and the roots of the *Auricula* certainly seem to delight in them, often penetrating the pith of the rushes.

then be shortened to within an inch of the leaves, leaving only the young and new fibres or roots. One great and fatal cause of the dwindling and disease of *Auriculæ* is the leaving too long a tap-root; it will most assuredly decay, and eventually kill the plant. When seed is required, repotting the breeders must be deferred until August. (*Johnson's Dict. Modern Gardening.*)

*Pots.*—The smaller the pots, consistent with the due supply of nourishment, the better, not only for convenience and economy of room, but because the needless development of root in any plant is always at the expense of its parts of fructification. Consequently we recommend the adoption of pots having the dimensions prescribed by Dr. Horner, observing, at the same time, that repotting annually, by supplying fresh soil every year, enables these smaller-sized pots to be employed without detriment.

The pots for a full-sized plant should not exceed four inches at the top, and three inches at the bottom, inside measure; they should also be made five-and-a-half inches deep to allow of abundant drainage, and should not be hard-baked, but left as porous as possible.\* It is a great and almost universal fault to

\* Against this recommendation by Dr. Horner, to employ slightly-baked pots, we enter a decided protest. In 1844, Mr. Slater lost a great many *Auriculas* that were growing in these porous pots, whilst those in hard-baked pots did very well.

use pots of too large a size. (*Gard. Chron.*, 1841, 397.)

Mr. Emmerton recommends the employment of a larger pot, and as he only repotted once in two or three years, such increased size was, under such treatment, advisable. The dimensions of the pots, and the mode of repotting, recommended by him, are as follows :—For large blooming plants the pots to be eight inches high ; five-and-a-half inches diameter at the top, and four-and-a-half inches at the bottom. In transplanting, place by the side of the hole a small piece of tile, and over the hole a hollow oyster-shell, resting on the edge of the tile (this plan drains off the water well), after which, fill up two or three inches deep with pieces of old loam, but not sifted ; if it has been soaked in manure it will be no worse ; after this, fill your pot about three parts full with the prepared compost, and let it be well shook down on your potting board ; this is too often

But this is not the only evidence against the practice, for the Lancashire weavers are some of the best growers of the *Auricula*, and on no account will they plant one in a soft, or slightly-burnt pot. The pots the weavers usually bloom their *Auriculas* in, are eighteens, about six inches diameter at top, and the same in depth. There can be no doubt, that the evaporation from the sides of porous pots must cause such a degree of cold as to keep the roots in a temperature relatively much too low, compared with that in which the leaves are growing.

neglected, but it assists the settling down of the mould, and will prevent the plant sinking in the pot, which is an eye-sore: trim the small roots or fibres to about three or four inches long, and be careful to spread them as horizontally as possible; press the earth tight round the edges of the pot, as well as in the middle round the neck of the plant; it ought to be firmly fixed to facilitate its growth; the mould, if kept in a shed, and is as dry as gunpowder, is the better for potting. Water those plentifully that have not been much wounded with a knife, by placing your pots in a tub, or other vessel of water, three parts up their sides; if the compost is dry, the water will, by this means, draw up to the roots sufficiently, which you will observe by the dry earth on the top turning black; those that have been much wounded should have water more sparingly, lest it cause them to rot. As soon as they are transplanted, place them all in a situation where they may not be exposed, either to sun or wind, if possible, till they have taken fresh root. If they are well watered when planted, they will require no more for six or eight days, or a fortnight, especially if it be a moist air, and the wind is inclined to the south-west; after this, they should be kept moderately moist, but not so wet as when the blossoms are expanding themselves. Your plants will strike fresh root in about a month or six weeks, you must then water sparingly; it is not



much required with this plant; but water, in very dry hot weather, early in the morning and evening, with a very fine rose, made for that purpose, all over the leaves, will be essentially necessary; but by ten o'clock the sun will have dried them. (*Emmerton*, 134.)

Mr. Henderson, of Delvine, N.B., agrees as to the best time of repotting, but as his practice differs in some particulars we will give the details he has afforded. He says, that the shifting season is always about the third week of May, when the plants have done flowering. At that season, shake the mould from the old plants, and cut the end of the stump up to the fresh young roots, if it has grown too long (Mr. Henderson is speaking of those plants which have been in the largest-sized pots for two years). After dressing the wounds with gum-mastic, to prevent gangrene, the plants are to be repotted in five-inch pots. Next May they are shifted, with the ball entire, into six-inch flowering pots. So that, from the first potting of the young plants in small pots, to a complete shifting, four years elapse; the plants having been one year in small pots, one in the second size, and two in the largest, or third size. A little river sand is put round the stems at all the shiftings; and if any wounds are made by taking off the suckers, they are dressed with mastic. At all times the stems are cleared of sprouts above ground as they appear,



but suckers from under are allowed to grow, in order to form young plants.

When the shifting and top dressing are over, the plants are set out upon bricks or boards ; if on the former, make a bed of sand under the bricks ; if on the latter, they are raised above the ground, so as to prevent worms getting into the pots. (*Caled. Hort. Mem.* iii. 230.)

Mr. Emmerton says, upon the same point, that certainly the best time for repotting is soon after they are out of bloom, say about the third week of May, and more especially if the weather is a little inclined to be showery ; but they may be planted with great success from the 29th of May to even as late as the 13th of July ; on no account remove a general collection a week later, at least those you intend to bloom very strong : by this means they have three or four months to get well rooted before winter, which they ought to have ; and if you transplant them early in the spring, it will be so near their time of blowing, that the check they will receive by transplanting will prevent their blooming strong. If a very strong superior bloom of flowers be desired do not suffer any offset to grow on the stock of the mother plant without fibres, but rub them off when they are about the size of hemp seed ; but those that spring up below the surface of the earth, you are at liberty to use your own pleasure about.

By no means remove your large blooming *Auricula* plants in dry hot weather, as by shaking the mould clean out of the plant the roots will not freely draw fresh fibres, except the weather is inclined to be showery, and what is termed a cool moist air. Fine young maiden plants, in small pots, may be repotted even in dry weather, for they can be slipped out of the pots with the whole ball of earth, and then immediately planted in a full-sized blooming pot for the ensuing season.

*Treatment after Repotting.*—We have already given the requisite directions for the placing the shifted plants in a place having a northern or north-eastern aspect, with shutters or other facilities for occasional shelter. Water must be given at the time of shifting, and afterwards at least four times a week, if dry weather, during the whole of June, July and August. During September and October they require not more than half that quantity of water.

Do not cut down the flower-stem when the bloom is past, as it sometimes rots down into the heart, and thus injures the plant. It is better simply to remove the flowers, leaving the stalk until it becomes sufficiently ripe to separate freely from the plant. (*Gard. Journ.* 1846, 324).

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## DISEASE.

THE *Canker*, or *Rot*, is the only disease afflicting this flower that we are acquainted with. This is really an ulceration, or moist gangrene, seated in the root. The first symptom of the disorder having attacked a plant is its loss of verdure, and its assuming a yellowish sickly appearance. Soon after it decays on one side, and becomes crooked, or else, the main root of the plant rapidly decays quite through, and the head drops off; in fact, the juices of the plant are vitiated at the time the foliage begins to appear sickly, so that no time must be lost in fresh potting it into proper soil, and removing it to a cool shaded situation: this is the only likely method to recover the infected plant; but it is certainly more advisable to prevent the occurrence of so dangerous a malady, by fresh potting the plants in the spring, than to run any risk by deferring the operation till autumn, or postponing it to the second year. (*Maddock's Florist's Direct.* 103.)

Some florists have thought the disease epidemic and contagious, because, when it does appear, it usually attacks many plants in the same collection. This, however, is no such proof, but merely evinces that the whole have been rendered liable to the disease by being all equally mismanaged.

We quite agree with Dr. Horner in thinking, that the disease is not contagious, but that it is simply the result of bad cultivation; what produces it in one plant, produces it in all. Want of drainage, old tap roots, damp, and confinement, are, severally and collectively, the principal causes of rot in the Auricula. To prevent it, repot annually, taking care to shorten the tap-root (a part peculiarly liable to canker and disease) to within an inch or an inch-and-a-half of the insertion of the leaves. Secondly, fill the pot nearly one-third with broken crocks. Thirdly, let the pots, in summer and autumn, stand in a shady, airy part of the garden, and elevated two feet above the ground. And, fourthly, place them, in winter and spring, in such a frame as is before represented. (*Gard. Chron.* 1843, 860.)

There are two other points deserving particular attention, to secure safety from the disease. Of these, the first is to have plenty of rubbly pieces of charcoal among the drainage, for these are grateful to the roots, at the same time that they are antiseptic; and the second is, that great care ought to be taken not to rend the main root of the mother plant in removing the offsets, for this often induces decay; less injury will arise from a clean cut with a sharp knife than from a forcible separation of the offsets by the fingers.

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## INSECTS.

The *Aphis*, Louse, or Green Fly. Mr. Hogg says, that if Auriculas, in the summer, are attacked by this insect, they ought to be put into a frame and smoked with tobacco ; for if they are suffered to continue so infested, it is impossible for them to thrive.

This treatment is permissible if the insects appear after the bloom is off ; but they also come, occasionally, whilst the flowers are in their beauty. The only mode of clearing off the enemy is, then, to remove them, one by one, with a camel's-hair brush, and as the plants are small this is not an arduous task.

*Slugs* do great damage at night, chiefly by crawling over the leaves until they reach the blossoms, of which they injure the eye materially, especially by eating the thrums out. To prevent this, sprinkle the tiles or slates, where the flowers stand blooming, with two or three handfuls of salt at night, just before you cover up ; unslacked lime would answer the same purpose. To these applications there are the objections, that they are unsightly, and that exposure to the weather soon renders them inefficacious. A permanent protection is, to wind some hair rope round the legs of the stand, or around each pot, cutting across the strands of the rope with a sharp knife, so

that the hairs start up at right angles. These form a *chevaux de frize*, impassable by slugs or snails.

*Bees.*—To prevent the humble, or any other bee, getting to the bloom while under glass, to which they will do no great injury, cover the openings either with yellow or green canvass, or, which less obstructs the light, with the lace net recommended to be used for the exclusion of insects from the breeders.

## THE ASPARAGUS.

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### HISTORY.

ASPARAGUS is known to have been cultivated as a culinary vegetable for nearly 2000 years. This cultivation originated, probably, in Greece, and has thence been diffused to the rest of Europe; for its name is uncorrupted Greek, signifying a bud before it has fully opened, clearly pointing to the state in which it is used for culinary purposes; and every nation in Europe knows it by no other names than such as are derived and corrupted from the Grecian. In German it is *Spargel*; in Dutch, *Aspergie*; in Danish, *Aspargis*; in Swedish, *Sparis*; in French, *Asperge*; in Italian, *Sparagio*; in Spanish, *Asparrago*; in Portuguese, *Espargo*; and in Russian, *Sparsch*.

*Asparagus officinalis*, or Wild Asparagus, is found native in Japan, and on the sea-coasts of most parts of Europe; and from this, there is no doubt, our Garden Asparagus has been raised. High cultivation—the abundant supply of rich appropriate manure—will work strange changes in all plants; and we



have no doubt upon our minds that—as in many similar instances—“the muck heap” has elevated the *Asparagus* of the beach into the *Asparagus* of the garden. It is quite true that some gardeners have failed in effecting this change; but, on the other hand, Miller and some more practitioners, equally trustworthy, succeeded in their experiments directed to the same point; and, in cases like these, one affirmative testimony is unshaken by a thousand negatives.\*

Cato flourished about 150 years before the Christian era, and in his work, just quoted, we have a full detail of the mode of cultivating the *Asparagus* pursued by the Romans. These directions are an epitome of those which occur in Abercrombie, Miller, or any other standard work on horticulture. They are as follow :—“ You must well work a spot, says Cato, that is moist, or which has richness and depth of soil. Make the beds so that you may be able to clean and weed them on each side; let there be a distance of half a foot between the plants. Set in the seed, two or three in a place, in a straight line; cover with mould; then scatter some compost over the beds. At the vernal equinox, when the plants come up, weed often, and take care that the *Asparagus* is not plucked

\* Even Cato was aware that the Wild *Asparagus* (*Corruda*), planted in rich moist soils, becomes that which is cultivated. (*De Re Rustica*, 6.)

up with the weeds. The year you plant them, cover them with straw during the winter, that they may not be killed. In the beginning of the spring after, dress and weed them. The third year after you have sown them, burn the haulm in the beginning of the spring. Do not weed them before the plants come up, that you may not hurt the stools. The third or fourth year, you may pluck them close by the root; if you break them off they yield side shoots, and some will die. You may take them until they run to seed. The seed is ripe in autumn. When you have gathered the seed, burn the haulm; and when the plants begin to shoot, weed and manure. After eight or nine years, when the beds are old, lay out a spot, work and manure it well, then make drills where you may plant some roots; set them well apart, that you may dig between them. Take care that the roots may not be injured. Carry as much sheep-dung as you can on the beds; it is best for this purpose; other manures produce weeds."

Columella, Palladius, and Didymus, also give us some more particulars of the Roman Asparagus culture, but nothing worthy of quotation in addition to the directions of Cato. That the culture adopted, combined with the mildness of the climate, was very favourable to the growth of this vegetable is quite credible, and we do not withhold credit from the relative statements of Pliny and Athenæus. Pliny states,

that at Ravenna, which, be it remarked, is a sea-port, *Asparagus* was grown so fine, that three shoots weighed a pound.\* Athenæus says, that, in Getulia, the stems were as strong as reeds, and twelve feet high. We do not disbelieve these statements, for we have seen, in England, six *Asparagus* sprouts weighing a pound, and its stems between eight and nine feet in height.

That it was a common and well-known dish at the Roman tables, appears from the habitual expression of the Emperor Drusus, when he required more than ordinary despatch, "Let it be done more quickly than *Asparagus* can be boiled."

It is more than probable that the Romans introduced the cultivation of this, with that of other products of the garden, into Britain. They would find it wild upon our coasts as upon their own, and would, probably, submit it to the same ameliorating culture. Be this as it may, it is quite certain that it was cultivated here at a very early period, and that its culture is detailed in the works of the earliest of our writers on such subjects.

*Asparagus* was cultivated in England, and known as Sparage, or Sperage, in Tusser's time, for, in his

\* We particularly note that Ravenna is on the sea-shore, because the best *Asparagus*, perhaps, in Europe, is grown now on the coast of Spain, and salt is found to be for it one of the best of manures.

“Five Hundred Points of Good Husbandry,” published in 1573, he says, “Sperage let grow two years, and then remove;” and Lyte, in his translation of “Dodonæus’ Herball,” in 1578, figures Asparagus, the Garden Sperage; and Corruda, the Wild Sperage.

Gerard’s “Herball” appeared in 1597, and here five kinds are delineated:—*Asparagus sativus*, Garden Sperage; *A. palustris*, March Sperage; *A. petræus*, Mountain Sperage; *A. sylvestris*, Wild Sperage; and *A. sylvestris spinosus*, Thorny Sperage. The first and second, he observes, “differ not in kind, but only in manuring, by which all, or most things are made more beautiful and larger.” In Gerard’s time, however, manuring, he says, had increased the size of its shoots to no greater circumference than that of “a swan’s quill.”

Didymus Mountain, or rather Henry Dethicke, in his “Gardener’s Labyrinth,” published in 1577, has a chapter on “What singular skill and secrets are to be known in the sowing, removing, and setting again, of the worthy herb named Sperage.” These secrets, however, as he unreservedly states, are mere extracts from the Latin and Greek writers, Cato, Columella, Pliny, Palladius, Didymus, &c.

Lawson, in his “New Orchard and Garden,” published in 1626, does not even mention Sperage among his kitchen garden herbs. But in France great atten-

tion was paid to its cultivation. M. Quintyni, whose "French Gardener" was translated by Evelyn, in 1673, gives very full and correct directions for its cultivation. By allowing them to remain uncut for four or five years, he says, they were then obtained "as large as leeks," which seems to be a forestalling of our "Giant Asparagus."

Forcing Asparagus was introduced by the Dutch gardeners who came with William III. (1688). He delighted in blanched vegetables; and this, among our gardeners, being a novelty, was at first named here after its introducers. "It is with us (says Switzer) truly called Dutch Asparagus," (*Kitchen Gardener*, 173). This writer gives sufficient directions for thus obtaining it early, and even some 30 years before him, viz., in 1697, Meager "mentions that the London market was, at that period, supplied with forced Asparagus early in the year. Some having old beds of Asparagus, which they are minded to destroy, and having convenience of new or warm dung, lay their old plants in order on the dung, and the heat doth force forward a farewell crop." (*English Gardener*, 188.)

From that time to the present the cultivation of Asparagus has advanced both in extent and excellence, until it has become a tenant of every country gentleman's garden, and is grown by many in perfection equal to that attained by any other cultivators.

It is especially cultivated, extensively, for the Lon-

don market ; and it is estimated that, in the parish of Mortlake alone, there are generally about 80 acres under this crop. One grower there (Biggs) has sometimes had 40 acres under Asparagus at one time. A great deal is also grown near Deptford ; and one grower there (Edmonds) has had 80 acres entirely under this crop—a thing which must appear almost incredible to those who have not witnessed the loads of this article daily heaped on the green-stalls of the metropolis for the space of nearly three months. In this country, Dutch Asparagus was preferred at the end of the 17th century ; and this variety is still distinguished for affording very thick shoots. In a garden formed at Dunbar, in the very beginning of the 18th century, by Provost Fall (a name well known in the mercantile world), Asparagus was for many years cultivated with uncommon success. The variety used was the red-topped, and it was brought from Holland. The soil of the garden is little better than sea sand. This was trenched two feet deep, and a thick layer of sea-weed was put in the bottom of the trench, and well pressed together and beat down. This was the only manure used, either at the first planting or at subsequent dressings. There was an inexhaustible supply of the article generally at hand, as the back-door of the garden opens to the sea-shore. (*Edinburgh Encyc.*)

It has now become an established and favoured

vegetable over the most of Europe, even in its most northern divisions. Austria is particularly renowned for growing it of a large size and excellent in flavour.

We have a statement in *Keysler's Travels*, published in 1760, in which he says, that "the goodness of the soil may be inferred from the largeness of the *Asparagus* that grew last year at Damstadt, for one head of it weighed half a pound." He further adds, that the Austrian gardeners generally lay some light sticks over the *Asparagus* when it appears above the surface; these shelter it from the inclemency of the weather, and cause it to shoot up apace. Besides, by this contrivance it is kept soft, for it is apt to become hard when exposed to cold winds.

*Asparagus* is more rare, and highly prized in Russia, as may be concluded from the following narrative by Storch, in his "*Description of St. Petersburg.*" Such tricks on culinary vegetables are of a nature too gross, and involve too much manipulation, for being practised or even credited in Britain, if not related by an author worthy of belief. He says that, after *Asparagus* has been used at the tables of the great, the returned ends of the shoots are sold by the cook to itinerating green-grocers, who carve a new terminating bud, colour it, and add a bloom, in imitation of nature, make up the ends so prepared in bundles,



with a few fresh stalks outside, and sell the whole as genuine asparagus.

The cultivation of this vegetable is introduced by our countrymen even into the hottest latitudes of the tropics.

Mr. J. Newman has published the successful mode he has adopted for obtaining it good in the island of Mauritius; and we have eaten of it—excellent in quality, and nearly of an average size—in Bengal. Daily irrigation is there the chief essential.

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## BOTANICAL CHARACTERS.

**ASPARAGUS OFFICINALIS.**—Common Asparagus, or Sperage. This vegetable is included in the Hexandria Monogynia class and order of the Linnean system, and in that of Liliaceæ of the natural arrangement.

*Roots* perennial, creeping, with very long, thick, simple fibres. *Stem* erect, occasionally procumbent, round, simple, and bearing alternate scales (or stipules without leaves below) in the upper part, branching in a panicled alternate manner. *Leaves* in tufts, very narrow and bristly, but flexible. *Stipules* solitary, membranous, triangular, acute, the upper ones ovate and jagged. *Flowers* from the axillæ of the branches on

capillary simple stalks, drooping, white, row of the segments inflexed, in some the stamens, and in others the pistil occasionally abortive; style deeply three-cleft. *Berry* red. The above are the specific characters of the wild *Asparagus* found abundantly on parts of the southern sea-coast of England, as Weymouth, Harwich, Eastbourne, &c. In its wild state the stems are not thicker than a goose quill, yet it is from this, by good cultivation, that the garden *Asparagus* has been raised.

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### CHEMICAL COMPOSITION.

WE are indebted for the following analyses to Dr. Thomson's valuable work on Organic Chemistry, where they have been ably collected and arranged.

*Asparagus sap.*—M. Robiquet found in this gluten, a resinous oil, albumen, asparagin, saccharine matter, potash, carbonate of lime, phosphates of potash and lime, and, probably, acetates of potash and lime. (*Ann. de. Chim.* lv. 152.)

*The root of Asparagus* was examined by M. Dulong d'Astafort. He obtained albumen, gum, a substance (asparagin) precipitated abundantly by subacetate of lead and nitrate of mercury; a resin; sugar, reddened by sulphuric acid; supermalates, chlorides, acetates, and phosphates of potash and lime; and iron. (*Journ. de Pharm.* xii. 278).

*Asparamide*, or *Asparagin*, is the constituent which imparts to the Asparagus its very peculiar flavour and properties. It was discovered in the juice of the *Asparagus officinalis*, by Vauquelin and Robiquet, in the year 1806. In 1827 Mr. Bacon discovered a principle in the root of the *althæa officinalis*, or marsh mallow, to which he gave the name of *althein*. Henry and Plisson repeated the experiments of Bacon, and showed that his *althein* was the same with the *asparagin* of Vauquelin and Robiquet. M. Robiquet in 1809 had discovered a substance in the root of the *glycyrrhiza glabra*, or common liquorice, to which Caventon afterwards gave the name of *agedoite*. This substance was further examined by M. Plisson, and shewn by him to be identical with *asparagin*. In the year 1830, M. Wittstock repeated the experiments of the French chemists, and rendered it probable that the *asparagin* obtained from the root of the *althæa officinalis* was formed during the process of extraction, and did not pre-exist ready formed in that root.

*Asparagin* crystallizes in rectangular octahedrons and six-sided prisms. It has no smell and but little taste. Its specific gravity at 55 degs. is 1.519. When heated it gives out ammoniacal water, showing that it contains azote as a constituent. At 57 degs. it dissolves in 58 times its weight of water, but it is much more soluble in hot water. Alcohol of 0.837

is a much better solvent of it than water; but it is insoluble in absolute alcohol, and likewise in ether.

According to Henry and Plisson, it may be dissolved in weak potash ley and thrown down from that solution by an acid. When digested with strong potash ley, ammonia is given out, and the asparagin converted into aspartic acid. When acids are mixed with it, they combine with ammonia, and aspartic acid is disengaged. This rather confirms the opinion of Wittstock, that asparagin is nothing else than a combination of aspartic acid and water. But if it were so, it is difficult to understand why acetate of lead forms no precipitate when dropt into a solution of asparagin; though it forms a precipitate when added to aspartate. Asparagin is not precipitated by the other metalline salts, nor by the infusion of nutgalls. (*Ann. de Chim.* xxxiv. 201—lvii. 88, and lxxii. 143; *Poggendorf's Annalen* xv. 346; *Journ. de Pharm.* xiv. 177.)

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## VARITIES.

THERE are but two varieties—the red-topped and the green-topped. These, we believe, are permanent, the first having the largest and closest head, but the second being better flavoured.

There were formerly vended by nurserymen, the

Battersea, Deptford, Cork, Dutch, Gravesend, Reading and Mortlake, but it is now well-known that these were merely fine specimens of the two varieties above-named, improved by high cultivation. The same observation applies to the Giant Asparagus, which is only the red-topped variety induced to grow to a larger size by an unlimited supply of congenial manures during its growing time, and planted deep, so as to enable a great length of stalk to be cut. By this observation we do not intend to disparage this improved growth, for we think it well worthy of cultivation, but we wish to warn our readers not to be disappointed if they find, under a less stimulating system of cultivation, they do not succeed in obtaining such a large and satisfactory produce.

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### PROPAGATION.

ALTHOUGH Asparagus is propagated only by seed, yet the gardener may establish it in his beds either by sowing where the plants are intended to remain for production, or he may employ rooted plants that have already attained the growth of two or three years. As every removal, especially to a plant with such fleshy roots, is a check and injury to its vigorous growth, if plenty of time can be allowed for the plants to establish themselves previously to being cut, seeds

are preferable to plants; but in cases where it is desirable to cut from the beds in the second season after they are formed, strong two-year-old plants will be more serviceable. (*Gard. Chron.* 1843, 73.)

*Sowing*.—As it is of great importance to have good seed, about the middle of May some of the finest heads should be selected and left for its production; and in autumn, when their seeds are ripe, wash these out of the berries, drying them as quickly as possible, and preserving them in a dry place until the following spring. The seed may be sown from the middle of February to the beginning of April; the most usual and best time is in the first half of March. The best mode is to insert the seeds by the dibble, nine inches apart, and an inch below the surface, two seeds to be put in each hole, or they may be sown in drills made the same distance asunder.

This will provide against the occurrence of failure, for if all vegetate, as the plants ought not to be nearer to each other than 18 inches, every alternate seedling may be removed. Sowing by the dibble or drill is far preferable to broadcast, admitting of cleaner husbandry and avoiding root entanglement, which is inconvenient whenever transplanting is required. If the seed be good, careful thinning will be required soon after the seedlings are well above ground, for a single grain often produces two or three *Asparagus* plants, bound together, from which the stronger shoot

should be separated. Were they planted together, they would grow in a cluster, produce very little, and last but a few years. (*Cal. Hort. Mem.* iii. 425.)

*Culture in Seed Bed for Transplanting.*—Make choice of a piece of ground which lies dry and slopes to the south, so that the rain may run quickly off the paths; the lighter the soil is the better. Dig into the ground in the autumn a large quantity of good dung, and point it over in the following spring for the purpose of loosening the ground, and mixing the dung with it. If dry weather, the bed should be refreshed with moderate but frequent waterings, and if sown as late as April, shade is required by means of a little long litter during the meridian of hot days, until the seeds germinate. Care must be taken to keep the seedlings free from weeds, though this operation should never commence until the plants are well above ground, which will be in the course of three or four weeks from the time of sowing. If two plants have arisen from the same hole, the weakest must be removed as soon as that point can be well determined. Apply liquid manure and salt frequently during the summer, and towards the end of October, as soon as the stems are completely withered, they must be cut down, and well putrefied dung spread over the bed to the depth of about two inches; this serves not only to increase the vigour of the plants in the following year, but to preserve them during the



winter from injury by the frost. About March in the next year, every other plant must be taken up and transplanted into a bed, eighteen inches apart, if it is intended that they should attain either another, or two years' further growth, before being finally planted out, or they may be planted immediately into the beds for production. It may be here remarked that the plants may remain one or two years in the seed bed; they will even succeed after remaining three, but if they continue four they generally fail. It is, however, certain that they are best removed when one year old.

The foregoing directions are very judicious, but as practices vary, and sometimes properly so, we will just detail our practice, as far as getting ready for the final planting is concerned. We prefer planting two year old plants, not that sowing in the bed is improper, but that this practice suits our rotation of crops best. We sow one small bed annually in the second week of March on highly manured ground: the manure in a very highly decomposed state. The beds are of course kept free from weeds, and watered occasionally. In the autumn, when the haulm is decayed, we cover the bed with six inches of half decayed leaf soil as a protection against the frost. In the month of April we prepare ground for transplanting then by digging deep and adding a great abundance of decayed vegetable matter, wood ashes, or burnt materials, with plenty of rotten manure. The plants are taken up

carefully when about four inches high, on a moist day; they are "tipped" at the root, dipped in a manure-puddle prepared on purpose, and placed in the bottom of a grass-barrow with high sides, containing a wet mat, which is kept constantly over them until they are transplanted. They are then inserted in rows in the prepared soil, nine inches between the rows and four inches between plant and plant. Nothing is necessary now but to give daily waterings when the weather is dry, and to keep them free of weeds through the summer. We generally, however, mulch with any leaf-soil or stable manure, three inches deep between the rows shortly after planting: this preserves the fibres from sudden and injurious vicissitudes.

For a bed  $4\frac{1}{2}$  feet wide by 6 feet long, a quart of seed will be sufficient. If sown to remain, then for three rows in a bed, 30 feet in length, half a pint of seed will be necessary. The seed will come up in three weeks.

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## SOIL AND MANURES.

ASPARAGUS being a native of the sea shore, and there only in sandy, shingly plots, from which an excess of water is removed immediately that the tide recedes, we thence may learn the contingencies essen-

tial to its existence, namely, the saline constituents of the sea, abundant moisture, and freedom from stagnant water to the roots. These are necessary for the plant's health, but to these must be superadded abundance of decomposing animal and vegetable remains, in order to make its growth gross and eligible for table use.

We may remark, that all good cultivation must be founded upon a similar attention to the same two points : whatever the plant's nature requires must be first secured to it, and then what art seeks to effect must be attained by additions to those requirements.

There have been repeated attempts to cultivate *Asparagus*, without the aid of the farm-yard manure, but always without that amount of success which is sure to attend a liberal application of the latter. This is not only a question of quality, but one of texture also ; for *Asparagus* will root with the utmost rapidity and freedom in old thatch, or any other loose vegetable remains, providing the due amount of moisture is provided.

*Soil.*—The best of all soils for *Asparagus* is a rich sandy loam, mixed with a small quantity of broken oyster-shells. It should be at least three feet deep—if five, so much the better—and resting upon a porous subsoil. If the soil is shallow, it must be trenched to the above depth ; and to secure a perfectly good drainage, the beds should be founded upon a layer of

brickbats, 18 or 24 inches deep, with a drain directly from it to some outside ditch or other outfall.

As, however, many kitchen gardens are of a very clayey or adhesive character, it becomes a grave consideration how to improve such for the cultivation of *Asparagus* at the most moderate expense ; for removing the whole of the soil, and substituting a fresh mass for the bed, is a process which cannot be at all times carried out. Soil of this character should, as before observed, be thoroughly drained, and this operation should take place in the autumn. In accomplishing this, the whole volume of the bed should be thrown out right and left, and remain in two sharply piled ridges until the early part of March, removing away, however, a considerable portion of the inferior or bottom soil or subsoil, in order to make way for other material to improve it. These ridges, in the course of the winter, will become somewhat mellowed, and fit to blend with any loose sandy soil, providing a thoroughly dry time be selected for the operation. Materials for this purpose should have been collected previously, and ready at hand when wanted. Ditch scourings, which had been laid to mellow, would be excellent, especially if turned once previously, and plenty of quicklime introduced. Loose sandy soils of any kind, the lighter the better, should also be used abundantly ; and even plenty of clean sand, a good coat of coal ashes, and materials from the

sea beach if at hand, especially if containing plenty of shells: any, or all, of these blended with the ditch-sourings would be found excellent materials for the case in hand. Plenty of manure also should be provided, and kept in two portions: the one containing old and rotten manure, and the other fresh and raw manure, or fresh manure and leaves blended. Equal portions of the above material and of the soil should be filled in when thoroughly dry, taking care to keep the raw manure at the bottom, and to introduce it of a rottener character progressively upwards. A little salt may be sprinkled with the whole mass in the course of filling in.

One thing we would here observe, and that is, that where strong soils are shallow, and if a stubborn and impervious subsoil exists beneath them, it would not be advisable to excavate, or, at least, to carry the depth of prepared soil below the heart of the subsoil. This we have often known done, and is, on the whole, a very doubtful proceeding, for excellent indeed must be the drainage which can keep a bottom of this sort free from stagnant water. We would rather carry the bed much above the ground level. The only fault of this latter proceeding would be this, that the beds would at times, during extreme hot weather, be too dry; this, however, might be easily remedied by summer mulching and occasional watering.

That part of the garden which is longest exposed

to the sun, and least shaded by shrubs and trees, is to be chosen for the situation of the *Asparagus* quarter.

In France, when making an *Asparagus* bed, a pit is dug five feet in depth, and the mould which is taken from it sifted, taking care to reject all stones, even as low in size as a filbert nut. This, however, is a very erroneous practice, for not only should the stones be left, but broken oyster-shells be added, to promote the drainage. The best parts of the mould are laid aside for making up the beds. The materials of the bed are then laid in the following proportions and order :—6 inches of common dunghill manure, 8 inches of turf, 6 inches of dung as before, 6 inches of earth, 8 inches of turf, 6 inches of very rotten dung, 8 inches of earth. The last layer of earth must then be well mixed with the last of dung. (*Cal. Hort. Mem.* ii. 247.)

If the above materials were thus prepared twelve-months before they were required, and the whole being decayed together, could be cut down and incorporated at the time of making the beds, the mixture would be good. But to put the turf fresh in layers is interposing barriers most unnecessarily to the deep rooting of the plants, in which they so much delight.

That such materials would produce fine *Asparagus* there can be no doubt, and so they ought, for we have here 18 inches in depth of manure, besides 8 of turf, both of which are costly materials. What the Aspa-

ragus wants is a good body of a sort of humus produced by decayed vegetable matter, interspersed with much sand; receiving moisture in abundance with freedom, and parting with it again with certainty and dispatch.

If a soil is naturally too tenacious for Asparagus—and it must be borne in mind that in a clayey soil no cultivation will make it succeed—a few loads of lighter soil had better be procured for making the beds. If this be unattainable, the only resource is to reduce the tenacity of the soil by a large admixture of pulverized oyster-shells, bone-dust, and ashes.

We are glad to find that others conversant with the culture of this vegetable agree with us in our estimate of the importance of good drainage to this crop. Thus Mr. J. Cox says, whatever mode of planting be adopted, whether in single rows or beds, it should be remembered that the basis of success is a perfectly dry subsoil. Consequently, wherever the subsoil is not naturally a dry one, it is highly advisable to adopt some other means to lay it dry, in addition to the ordinary drainage, which should always be good. This has been done in a very effective manner, by removing the soil to a greater depth than is usually considered necessary, and placing a layer of blackthorn bushes at the bottom, which were covered with turfy sods not chopped, then a layer of strong manure, filled up with soil and manure alternately. The finest



Asparagus was produced from beds thus formed, and on a portion of them being removed three years after, the roots were found to have descended a perpendicular depth of five feet. (*Gard. Journ.* 1847, 52.)

Mr. Cox's plan, as here detailed, is indeed excellent, and, withal, economical. We would say to those who have small brushwood at hand, use it by all means on all occasions, less or more. Only, in clay soils, do not depend on small brushwood for permanent drainage. It will act tolerably, if not too small, for a year or two, but after awhile the smaller particles settle into a close humus, and tend to intercept the drainage.

*Salt.*—That this should be beneficial to Asparagus might be justly anticipated from the fact that it is a marine plant. Such anticipation many years since led to its sparing application to the Asparagus bed, but it is only within these few years that its abundant use has been ventured upon. What led to it was the accumulation of facts such as the following:—

By the inundations of the sea, at Friesland, in 1825, the oak, the mulberry, pear, peach, and others with deep roots, did not suffer; neither did the asparagus, onions, celery, &c., for they were never finer, or more luxuriant. But the vines and gooseberries contracted a salt taste; and the apricots, apples, cherries, elms, poplars, beech, willows, &c., could not bear the over dose of sea-water. They pushed out a few leaves, but speedily perished. (*Sharon Turner's History*, 117.)

Similar results were noticed, after an inundation of the sea, in the garden of the late talented Richard Gower, Esq. near Ipswich, in Suffolk, in November, 1824. In this instance a portion of the garden remained 24 hours under the sea water. The asparagus beds were materially improved in their produce. The cherry trees, in the following year, actually produced a numerous crop of cherries, which tasted, however, so very salt that they could not be eaten, although very fine in appearance. These trees all died in the following year, 1826.

The finest Asparagus, as we shall see in the next section, is grown in the north of Spain, in places intentionally and repeatedly covered by the flowing tide of the sea. We have for many years, and with unfailing benefit, sown salt thickly over our Asparagus beds, and if any one complains of their own being unproductive, we always inquire if they have had any liquid manure and salt? We, therefore, agree with Dr. Lindley, that undoubtedly salt is extremely beneficial to Asparagus; and that this plant will take a great deal of it, and be much the better for it, is equally certain. The same is true of sea-kale. Both are shore plants, and are abundantly fed with salt at all seasons. How much the largest quantity may be that they will endure is uncertain, but we have seen a pound of nitrate of soda given to one seakale-plant without the slightest injury, and it would no doubt have found no

inconvenience from as much common salt; nevertheless, there are those who are unable to discover the utility of salt as a manure for Asparagus. The reason of this is well pointed out by Mr. Beaton. It is, he says, a general rule to cut off all weak shoots while the Asparagus beds are in bearing, or at least up to the beginning of June. Under such treatment the plants cannot be much benefited by whatever dressings the beds receive through the winter or spring, because all plants—the Asparagus among the rest—can only collect and digest their food and store away the product for the next growth, while they are in a growing state; and in all herbaceous plants like the Asparagus this store is laid up in the roots. Now, whatever may have tended to improve Asparagus must have been stored before the end of the autumn; and salt given to beds in March must go through a wonderful process, along with other agents, in the course of the summer, before it can be stored in the roots when the growing season is over, or tell upon the crop in the following May. These are simple facts, well known to the gardeners of the present day, but of which many of the last race of gardeners entertained strange notions, judging from their mode of loading their Asparagus-beds in winter with dungs and compost, a practice which is not yet got rid of, but which, compared with the improved system of feeding plants in

summer, while they are in active growth, is a mere waste of time and materials ; not that winter-dressing is lost on the plants altogether, although the best part of it is ; but that if the same amount were given in summer in a liquid form, when the plants could at once appropriate it, the benefit would be out of comparison in favour of summer manuring, not only to Asparagus, but also to sea-kale and rhubarb. (*Gard. Chron.* 1843, 387.)

In the few cases in which salt has been said to be injurious, the beds have either been in bad condition as regards drainage, or it has been applied to beds newly formed, and therefore to plants with wounded roots, for such recently planted Asparagus must be considered to be, however carefully the plants may have been taken up. The same injurious effect might also be produced by the salt coming in contact with wounded portions of the plant, whether of the roots, in consequence of cutting the sides of the beds when throwing up the soil from the alleys, or of the crown, in cutting the shoots. A tree will be killed by the application of a quantity of salt to a cut root, although a much larger quantity might be given with impunity when the roots are in a sound state. Along with the salt some have used night-soil ; liquid manure fixed and prepared with sulphuric acid ; Potter's liquid guano, at the rate of half a pound per square yard, following the application by plenty of

water. These have been all employed with marked advantage.

The quantity of salt that may be used is truly astonishing. We have tried it for the last three years, and approve of it much. Indeed the natural habits of this plant point at once to the propriety of a frequent application of salt. Mr. Beaton argues very ingeniously on this head, and his remarks are undoubtedly in the main correct. There is, however, such a thing as a pressure of business at certain periods in gardening, and any recipe to be generally useful must be simple. Therefore we would say, as a broad rule—seeing that salt is by no means a costly affair—give the beds a salting in November, in December, and again in January, in preference to a very heavy dressing all at once. This will no doubt infuse enough of the saline principle for the succeeding summer, and if liquid manures can be applied in July abundantly and during hot weather, so much the better. We have salted two years according to this plan, and it seems to us perfectly satisfactory.

It must be mentioned, however, that it is the opinion of the best cultivators, that in addition to these substances, *Asparagus* must have farm-yard manure, if it is to be grown well. This, says Dr. Lindley, is true, probably, in the case of heavy, or close land; but in loose friable soil must be un-

necessary, for such soils do not require that their texture should be improved. (*Ibid.*\* 1846, 147.)

It is most probable, that the other salts contained in sea water, such as the sulphate of magnesia, chloride of calcium, and chloride of magnesium, are also very beneficial to the Asparagus. Hence manuring with *fresh* sea weed, and even watering with sea water, have been found more beneficial to Asparagus than the application of crystallized salt.

Thus a very good authority says, for many years I have known sea weed, and strong sea sand, taken wet from the receding tide, used as a dressing for Asparagus beds, and I never knew those beds to fail. Now the secret of this application is in the saline qualities of the weed and of the sand, and not in any substantial quality of the sea weed, for when that is dissolved there is nothing left for the earth of the beds

\* With all deference to so high an authority we are of opinion that if size, amount of produce in the aggregate, and tenderness, be the points to aim at, farm-yard manure, especially if blended with ordinary vegetable matter or leaf soil, will exceed all other applications, either on clays or sands. We much doubt too the correctness of the opinion, that loose, friable soils do not require their texture to be improved. With regard to sandy soils, we are aware that they do not require any consolidation; they, however, require, mechanically speaking, something both to absorb moisture, and to transmit or equalise it afterwards, and this we would submit is one part of the office of rotten manures in sandy soils.

to feed upon. An attentive observer of the natural history of the Asparagus plant, cannot fail to discern the propriety of using saline manures in its growth ; and the same treatment as to sea weed and sea sand applies to sea-kale. Both these plants are indigenous in Cornwall, and there is an island near the Lizard Point, called Asparagus island, on which that plant grows, and where I have frequently gathered it. In heavy gales of wind the sea breaks over the part of this island on which the Asparagus grows. The soil is sand, and loose decomposed vegetable substances. (*Gard. Chron.* 1844, 524.)

Another authority adds, that sea water is the best of all means of applying salt ; because it is a vehicle for other substances, such, for instance, as chloride of magnesium, on which it is probable that the Asparagus feeds. We should water our beds with sea water during the whole of the season of growth, and also in the spring, just when the shoots are beginning to move. (*Ibid.* 1843, 577.)

If salt water be employed, we recommend a close imitation of that of the sea ; using it as weak as it is found, usually, near the mouth of a river. This may be effected by dissolving two-and-a-half ounces of common salt and half an ounce of Epsom salts (sulphate of magnesia) in each gallon of water. This solution might be poured over the bed plentifully once a week.



If salt in a crystalline form is used, 2 lbs. per square yard may be put on thrice a year—in the middle of January, April, and in July, about a month after cutting has ceased. Let no one think this too much, for we have seen quite as much used for years with great advantage. This is not our experience alone, for we can add this testimony from a practical gardener in the east of England.

Long before any heads make their appearance, he forks in some manure from an old cucumber-bed, levels the surface, and completely covers the beds with fine salt, at least a quarter of an inch in thickness. If no rain falls for some time, he endeavours to wash it in by copious waterings, and even if there is rain in addition, as the salt is some time before it entirely disappears; the watering and the sun together often cause it to form a crust, which it takes some weeks to dissolve, and upon tasting the surface of the soil it may for weeks after be found very perceptibly salt. But what is the effect? Every weed is entirely destroyed, and the beds are as clean as a well-trodden turnpike-road. But the *Asparagus*! what becomes of that! that thrives, and improves in a remarkable manner. The writer is accustomed to see bundles of very fine heads from Ely and Wisbeach, which places are noted for excelling in the growth of this vegetable; but, he adds, that he never saw finer than his own, and all this alteration was caused in a few

weeks in plants before almost valueless. (*Ibid.* 1842, 435.)

*Dungs.*—We are strongly in favour of employing the most stimulating and most readily decomposing, and we add early in every spring, usually in February, a heavy dressing of either night-soil or pig's dung, sprinkling a little earth and lime over it to remove any unpleasant appearance and effluvium. Some gardeners, of undoubted skill and experience, do not use dungs, but instead of them highly-decomposed leaf-mould. Thus—

Mr. Craggs, gardener to Sir T. D. Acland, Bart., has not put a barrow-load of dung on his beds for four years. In the summer months, he keeps the rubbish of the garden burning, preserving the ashes dry until autumn, and, as soon as the Asparagus is fit to cut down, he takes off half the soil above the crowns with a fork, laying it on the alleys; he then puts on three inches in thickness of burnt rubbish, running it through with a fork as near the crowns as possible without injuring them. He then takes a portion of the soil that has been removed, and covers the bed with it, allowing it to remain on them through the winter. Early in March he mixes the whole well together with a fork, and rakes the bed off regularly, watering with manure water once a week through the growing season, if required. (*Hort. Soc. Journ.* ii. 41.)

Another party uses both dung and decayed leaves, putting the former on in the spring and the latter in the autumn. His directions are as follow :—

Cover the beds with rotten dung, and let it remain on all the summer, which will keep the beds moist, and nourish the young plants. As soon as the stalks are decayed rake off the dung, and put on three or four inches of rotten leaves, such as have been used for forcing melons, pines, &c. The leaves will be much improved by having been exposed for some months, and turned over two or three times before they are put on the beds. Put a light covering of mould over them to prevent their being blown away by the wind. Apply leaves in the same way every autumn, until the mould becomes as deep as it is wanted above the roots of the plants, increasing the quantity laid on at once according to the strength of your plants. It will be necessary to have the paths covered with long dung or litter, to prevent their being trod too hard for the roots to run in. The paths should never be dug, as is usually done, nor even the beds dug with a prong, which is often done, much to the injury of the crowns. The leaf mould when decayed will be found sufficiently light for the plants to rise through without digging. Any vegetable mould will be found to answer well, particularly the mould of green vegetables. Holes and ditches in and adjoining woods generally abound with decayed leaves, which, if mixed

with leaves that may be collected, or any useless litter, will soon become a large quantity of mould. (*Gard. Mag.* ii. 278.)

*Potter's Guano* may be applied at the rate of half a pound per square yard to Asparagus beds. It should be well diluted in water, and applied in portions weekly during the early part of summer, commencing immediately the cutting is over. (*Gard. Chron.* 1844, 656.)

*Nitrate of Soda* has been applied, it is said, with great advantage to Asparagus. It should be sown over the beds in May, and not more than 2 lbs. to every 16 square yards.

In casting a glance over preceding statements and opinions, and adding thereto our own opinion, founded on a practice of many years, we would suggest that the following points are perfectly established, viz., first, that a loose and friable soil is most congenial to this vegetable; secondly, that it should be rich in vegetable matter at least, if not of active manures; thirdly, that a very considerable depth is necessary, not less than two feet; and lastly, that this soil must be well drained. With regard to the last, it must be remembered that the Asparagus in the growing season loves moisture in great abundance, although it is impatient of stagnation. It remains, therefore, for some one to do justice to those principles which, after all, may be copied in the main from a well managed Eng-

lish water meadow—combining thorough drainage below with timely irrigations. The only thing necessary would be to infuse the saline principle: this is so easy that it needs no comment.

Before finishing this division of the subject, we would beg to impress on the inexperienced in its culture the propriety of using charred, or rather burnt, matters, in combination with salt and manures. Much and weighty testimony exists as to the utility of such applications; as to their economy, that requires no remarks. Hedge clippings, vegetable haulm, tree leaves, and weeds, may be put together and burnt for this purpose.

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## OPEN-GROUND CULTURE.

*Beds.*—Some of the precautions required in the construction of these have been incidentally noticed in the previous section, under the head “Soil.” If the requisites for its staple and drainage, as there directed, are carefully provided, it is of very secondary consequence whether the beds, as usual, are raised above the level of the surrounding ground, or whether their surfaces are of equal height, as recommended by Mr. Beaton. In very stiff and retentive soils, however, and where the surface soil is of a shallow cha-

racter, it will be well to keep rather above than below the ground level, for reasons previously given.

In ordinary cases it is well to keep the crowns of the plants at the ground level ; if the soil is deep, dry, sandy, and hungry, it will be as well to keep a little below it.

With regard to the preparation of ground, it is a good plan to commence with peas, to be followed by celery. Appropriate a considerable plot for these, or, in other words, keep them together as much as possible, for the sake of system ; and having an even number of rows, make it a rule to sow two at a time, at the distance of from four to five feet ; and these, when picked, and the haulm cleared away, furnish space for a bed of celery of about the same width. The peas being removed, the ground is marked out for the celery-bed, after what is termed the Scotch method. The bed is now excavated to the depth of a foot, the soil thrown right and left, and made compact ; and then six or eight inches of half-decayed leaves and dung, chiefly of the former, and which had been used as linings to pits or frames, is trenched in, at least a foot deep in the excavation. The surface is now covered once more with three inches of the best rotten manure, which, when spread, is forked in and duly mixed. The bed is then planted, and when taken up for use, the operation, with a little care, levels and leaves the bed right for planting the

Asparagus when the period arrives. (*Gard. Chron.* 1844, 667.)

Mr. Craggs, gardener to Sir T. D. Acland, Bart., gives the following directions for the selection and preparation of the ground for the beds :—

In selecting the ground for permanent beds, choose a piece free from trees, and sloping to the south if possible, giving a preference to a strong sandy loam, of the depth of three feet ; and if not naturally so deep, making it that depth artificially. Take out a trench two feet six inches wide, and three feet deep ; laying one-third of the soil on the vacant ground where you commence, and carrying the other to the place where you intend to finish. Suppose the trench to be now taken out, and the ground ready for trenching, lay over the whole surface six inches in depth of dung from old hotbeds, shaking it well with a fork. Turn in the first spit and crumb with a full-length spade into the bottom of the trench, mixing the dung and soil thoroughly together with a fork ; then throw out the other soil, until the second trench is the same depth as the first ; and so proceed until you come to the last trench, into which throw half the earth taken back, and add dung equal to that for the first spit, mixing it and the soil well together with a fork as before. Now that the ground has been once trenched over, and the bottom spit thoroughly mixed, tread the whole surface, and again lay on it about six inches



in depth of dung, shaking it well as before. Then proceed to trench the ground back, leaving the bottom spit, that has been mixed with manure, unmolested. Proceed as before, after the first spit and crumb have been turned in; mix the dung and soil well together with a fork, which will be two-thirds of the trench mixed, throwing on the top the remainder of the earth unmixed with dung, until you come to the first spit that has been mixed, and so continue until the ground has been all trenched a second time; then throw in the earth laid out at the commencement of the trenching, adding dung equal to that for the spit just thrown in, and well mixing it with the soil. There will now be an opening at the top, and one-third of the earth left at the bottom. Tread the whole surface over, and again lay on six inches in depth of dung, forking up the hill, and keeping the same opening. The whole mass of earth and dung will then be thoroughly mixed from bottom to top, and the opening will take the remainder of the earth thrown out of the first trench. The work should be done in dry (not frosty) weather—say in October. The ground being thus prepared, throw it up in rough spits, one spade deep, to be pulverized by the frost against planting time. (*Hort. Soc. Journ.* ii. 39.)

In laying out the beds they may be made two feet wide, with a single row of plants down the centre, or

three feet wide, with two rows, 18 inches apart. The latter we prefer, because it secures economy of ground, as well as facility of weeding, and other after-culture, without the necessity for treading upon the beds, which is always to be avoided. The only advantage of beds, two feet wide, is that they are more convenient if the Danish mode of forcing, described in the next section, is adopted.

*Alleys*, or trenches, between the beds, are necessary to prevent the necessity for treading upon the beds, as well as to enable the roots of the plants to be earlier stimulated by sun-heat in the season; and when it is wanted early that is of importance; sometimes, also, they are used for irrigating, or for receiving stable-litter for forcing. For the sake of free exposure to the rays of the sun, the beds should always range north and south.

*Beds level with surface.*—Mr. Beaton, the excellent gardener at Sir W. Middleton's, Shrubland-park, near Ipswich, says, that—

By far the best way of growing *Asparagus* is, in single rows, 3 ft. apart, and 9 inches plant from plant; but if the ground is not deeper than 2 ft. or 30 in., or if room is scarce, the rows need not be more than 30 inches asunder.

Mr. Beaton says, he has grown *Asparagus* this way for the last 15 years, and given them no dung in winter, merely clearing off the stalks and weeds in

October, and pointing over the surface, about 2 in. deep with a fork, and leaving it as rough as possible. Early in March, when the surface is quite dry, it is raked down, and about 2 inches of soil drawn over the crowns from each side of the rows, which gives the ground something of the appearance of a plot of peas earthed up for the first time; when the gathering is nearly over, the ground is stirred again to loosen the trampling made in gathering the crop. The hollow between the little ridges is then filled up with a powerful compost, consisting of equal portions of sandy soil, leaf mould, and pigeon's dung; the whole is then drenched with liquid manure from the stables, cowhouses, or laundry, and the foreman of the kitchen garden gets *carte blanche* to water the Asparagus any day through the growing season, when he can best spare his men, or, at all events, every fortnight, and always with liquid manure, if possible; as to the quantity of water, the only instruction he gets is, that he cannot drown them. This is cultivating the Asparagus in summer. In very dry seasons, it is of great advantage to mulch in between the rows with short grass, or any litter. Some have an idea that the frost should be kept from Asparagus, and go to some trouble to do so, but it is in reality as hardy as the oak, or any other of our native plants. (*Gard. Chron.* 1843, 387.) So far is Mr. Coulam, of Louth, in Lincolnshire, from thinking Asparagus

requires shelter whilst in a state of rest, that he recommends it to be especially exposed to the cold. He says that—

The best treatment is to cut down the tops to nine or twelve inches above the ground, and to fork over the beds in November between the rows, and to lay the crowns bare, for the frost to act upon, by turning the soil into the walks, there to remain during winter. As soon as the frost breaks up, return the soil out of the walks to the beds, which will be good and rich; then fill up the walks only with good manure, and dig it into them to be in readiness for another year, and it will cause the outside rows to push the shoots a week or two before the centre of the bed, and it makes a succession. The frost will not injure the roots of either *Asparagus* or *Rhubarb*; it invigorates and makes them grow stronger. Mr. Coulam says that the stalks of his *Asparagus*, thus treated, are from 7 to 9 feet in height—more like young *Larch Firs* than *Asparagus*. In returning the soil from the walks in the spring, add salt mixed up with the fine pulverized soil before returning it to the beds. (*Gard. Chron.* 1845, 836.)

We happen to know, by experience, that *Asparagus* may be cultivated in a first-rate way by the single row system, as detailed by Mr. Beaton. This was a favourite hobby with ourselves for a few years. We, however, find that double rows, under a good system

of cultivation, are more productive on a given amount of land. We are sorry to differ with so respectable an authority as Mr. Beaton about the liability of injury from frost to this plant. We have twice or thrice suffered from it; generally, however, in soils that were either naturally retentive of moisture, or had become what gardeners term "soddened." We took up some roots in the early part of January of this year, to force: part were put in the frame over night; the remainder were frozen so hard that we thought it prudent to let them remain for a day or two. We therefore covered them with a little soil and some litter, and they lay for a fortnight after. A thaw ensuing, we took the first opportunity of introducing them to their partners. Very different, however, has been the success of the two portions. The first were strong, and vegetated quickly; the second were singularly tardy, and when they budded their shoots were few and weak.

*Extent of Beds.*—The quantity of ground sown or planted, even in the smallest garden, should not be less than a rod, as it requires that extent of plantation to produce a single good dish. For a large family, one-eighth of an acre will be requisite; but five poles, planted with 1600 plants, will yield from six to eight score heads daily for a month. A crop from seed will allow of one stalk from each plant being gathered the third spring, two stalks the fourth spring, and three

or more the fifth ; while a plantation of two-year-old plants, transplanted, will allow of one stalk being cut from each plant the second spring, two the third, and so on.

For a moderate sized family, beds extending over from 140 to 200 square yards, and containing from 700 to 1000 plants, will yield a sufficient supply throughout the season.

An *Asparagus* bed formed of a genial soil, and properly drained and managed, will continue in plentiful production for thirty years. If the beds are of sufficient extent to allow of their being cut from only once in two years, they will make bountiful returns for a century or more. (*Cal. Hort. Mem.* ii. 250.)

It may here be remarked, that the amount of ground under *Asparagus* must ever depend on two important circumstances, viz., the quantity and frequency of the cuttings, and whether the forcing of *Asparagus* is carried to much extent. To this a third consideration may receive some attention ; and this is, whether, for the sake of any fine “grass,” the proprietor is willing to adopt the resting system, which is proved, by both science and practice, to be perfectly correct. The great longevity of *Asparagus*, alluded to here, will be found tolerably correct, providing the beds are originally established on good principles ; that cutting does not commence too soon ; and that a system is followed up of giving the beds in succession a rest

every third year ; that is, cutting two years, and totally resting the third.

*Mode of planting.*—The plants being taken from the seed-bed carefully with a narrow-pronged dung-fork, with as little injury to the roots as possible, they must be laid separately and evenly together, for the sake of convenience whilst planting, the roots being apt to entangle and cause much trouble and injury in parting them. They should be exposed as short a time as possible to the air, and to this end it is advisable to keep them until planted in a basket covered with a little sand. The mode of planting is to form drills or narrow trenches five or six inches deep and a foot apart, cut out with the spade, the line side of each drill being made perpendicular, and against this the plants are to be placed, with their crowns two inches below the surface, and twelve inches asunder.\* The roots must be spread out wide in the form of a fan, a little earth being drawn over each to retain it in its position whilst the row is proceeded with. For the sake of convenience, one drill should be made at a time, and the plants inserted and covered completely before another is commenced. When the planting is completed the bed is to be lightly raked over, and its

\* We do not know the greatest depth at which *Asparagus* may be buried with impunity, but the deeper it is placed from the surface the later will it vegetate in the spring. The crowns never rise nearer to the surface.



outline distinctly marked out. Care must be had never to tread on the beds—they are formed narrow to render it unnecessary—for everything tending to consolidate them is injurious, as, from the length of time they have to continue, without a possibility of stirring them to any considerable depth, they have a natural tendency to have a closer texture than is beneficial to vegetation. Water must be given in dry weather daily until the plants are established.

Another and most excellent plan, adopted by Mr. Errington, is as follows:—

In planting, the beds are to be set out for two rows each, the rows two feet apart, with an alley of four feet between them. The line being stretched precisely where the *Asparagus* is to be, make a slanting cut sloping from the line, about nine inches deep, and the soil thrown out as in forming an edge for box; the same cut is to be made on the opposite side of the line, leaving a sharp and angular ridge, across which the plants are set astride; the operator taking half the roots in the one hand and half in the other, divides them across the ridge, at the distance of ten inches between plant and plant. Previous to planting, however, some fine highly decomposed vegetable matter is to be placed up the line, in contact with the roots, and pressed firm; the roots are slightly tipped, and dipped in a puddle of thick dung water. The plants should be at least two years old, for it is a

waste of ground to plant earlier, unless in case of emergency. The young plant must be watered every morning for a week, unless rainy. The only treatment necessary the first year, at least through the growing season, is to keep them perfectly free from weeds. If any crop is planted between them, it should be a row of Coleworts from a June sowing, which would make their growth chiefly after the Asparagus had done its best. In November, the ground is to be dressed with good rotten manure, and in spring the alleys are thrown over the manure, just deep enough to cover it. No cropping can now be carried on between the rows, although a good crop of Cauliflowers may be grown in the alleys. The next point is the mode of dressing pursued in the autumn of the second year. It is of much more importance to feed the Asparagus at the extremities of the roots in the alleys, than over the crown : good cultivators of it, in brick pits, do not allow the alleys, after forcing, to remain empty all the summer ; they are filled with good rotten manures, and any one who has witnessed the emptying of these alleys in autumn, preparatory to forcing, must have been struck with the abundance of strong white roots, of which such alleys are full, and which are annually (it may be) cut off. Such roots can scarcely be produced from the crown ; and it occurred to Mr. Errington some years ago, that the alley, above all, should be well attended to with ma-

nure. He, therefore, in November of each year, as soon as the ground is cleared of dead stalks and weeds, causes all the loosest of the soil to be drawn off the beds with a rake; the bed is then well dressed with very rotten manure, and left for the winter. In February the alleys are dressed about from six to nine inches thick, with half-rotten manure and leaves, from partially decayed linings, which is trenched down very deep, and the bed is then soiled, over the manure, to the depth of four inches, with fresh soil from the alleys. This completes the whole course of culture. Finding the plants much injured by winds, in the growing season, lines of cord are run up the principle rows, to support the stems. (*Gard. Chron.* 1844, 667.)

The foregoing detail of cultivation, as practised by ourselves up to the year 1844, has been continued up to the present time with little deviation. Few obtain a greater amount of success; few have paid more attention to the cultivation of this delicious vegetable for many years. We may here be permitted, perhaps, to repeat, that we lay the utmost stress on the due cultivation of the alleys. Mr. Beaton calls his liquid manuring and application of saline matters, "Summer cultivation;" we beg to lay claim to this title also, in common with Mr. Beaton, for our alley cultivation. Whatever mode be adopted, we would beg to remind *Asparagus* growers of the great vital powers possessed

by the old *Asparagus* roots, even if cut asunder by the spade. The stump will, if proper facilities be afforded, again push forth gross roots, with all the vigour of youth, and this circumstance led us some years since to pay a great amount of attention to the cultivation of the alleys.

It is of very great importance for the ensuring of success in the planting of *Asparagus*, to lift the roots carefully, and to expose them to the air as short time as possible. No plant feels a hurt in the root more keenly than *Asparagus*; the fibrils are very brittle, and if broken, do not readily shoot again. (*Nicol's Gard. Kalendar*, 47.)

With regard to the distance at which *Asparagus* should be planted, we have already expressed our opinion upon the importance of having wide intervals between the rows and between the beds, to admit freely the light and the air, but we will fortify our recommendation with the authority of two other experienced gardeners, who recommend even wider intervals than we have adopted.

Mr. J. Wighton, gardener at Cossey Hall, says that, to raise large *Asparagus*, the soil should be made good to the depth of 5 or 6 feet; then laid out in beds from 4 to 6 feet wide, with paths between them of the width of  $2\frac{1}{2}$  feet. The plants must be put in 2 feet apart, and the stems not allowed to approach each other nearer than 2 feet; or beds 3 feet

wide, with one row of plants down the centre, and the plants  $1\frac{1}{2}$  feet asunder in the rows, would be preferable. It is a very common error to allow too many stalks to grow close to each other. If this be permitted, however good the soil, the Asparagus is sure to be small; as the stalks, when so close, draw upon each other. Weak and small stems produce invariably weak Asparagus; for it is at the bottom of these that the Asparagus springs. (*Gard. Mag.* 1837, 358.)

Mr. W. Dickson, of Redbraes, near Edinburgh, recommends the rows to be three feet and a half apart, and the plants nine inches from each other; observing, that the produce will be much stronger than that from plants crowded together in beds; and he reckons that two rows, planted as described, will produce more than three rows planted in beds in the usual way. (*Trans. Hort. Soc.* vi.)

*Time for planting.*—It is usually recommended to plant in March, but recent experience demonstrates that April, May, and even June, are preferable months. Some orchises, and other fleshy rooted plants, can only be moved successfully whilst vegetation is active. This is the case, too, with Asparagus. Every one must have suffered from failures in March planting, but if the planting be in May, these very rarely occur. Mr. G. Fleming, the highly skilful gardener at Trentham Hall, observes that—It may

appear that *Asparagus* planted in March, and having the whole season to grow in, must have a better chance of doing well than that which is transplanted in the middle of its growth; but it is evident, that whatever advantages may arise from early planting, are counterbalanced by the ground being cold and wet, and the roots of the plants being so tender that many of them perish before the vegetable principle is excited; while at a later period the case is different, as the juices of the plant are in motion at the time, and the soil being in a warm and genial state, is prepared to encourage immediate growth. Mr. Fleming has planted repeatedly, and most successfully, in the beginning of June. (*Gard. Chron.* 1844, 276.)

Mr. Errington invariably plants in May, or, in fact, when the *Asparagus* is what the market-gardeners term "in feather," that is, about six inches high. He finds, by many years' experience, this is the best time; and, perhaps, one of the best proofs of it is, that he seldom or never loses a plant.

After the round of two more years, we beg to recommend late spring planting; that is to say, April or May; or rather when the "grass" is about six inches high and beginning to "feather." This, we believe, is the most general practice of the market gardeners in the neighbourhood of the metropolis; or, at least, we once heard Mr. Cock, of Chiswick,

declare it to be so. Nevertheless, to be successful, it must not be done at this period in a neglectful way.

We still pursue the same course of practice as that detailed in the *Gard. Chron.* 667, 1844; if we have differed in any thing, it is in making a more liberal use of salt. The Asparagus, after planting, must be attended to with water daily; if dry, for one fortnight after planting; after which it may be left safely to itself. A good coating of half rotten mulch, three inches thick, should be laid over the soil: this will break the action of the water, and thereby prevent puddling of the surface. Towards the end of July the young plants will throw up a second shoot of a much stronger character than the original one: this should be soiled up a little, when half a yard in height, to prevent wind waving.

We may remark here, that Oulton Park Gardens are celebrated for their produce of fine Asparagus, and it is gratifying to know that another very successful cultivator of this esculent, Mr. Craggs, gardener to Sir T. D. Acland, Bart., adopts a similar rule as his guide to planting time. He says:—

Plant when the stems have grown about an inch above the ground in the seed bed, choosing a dry day, when the soil will work freely. After having marked out the beds four feet in width, and having allowed two feet for the alleys, strain a garden line on each



side, and with a rake draw the soil equally off the bed into the alleys, about two inches and a half deep. Then strain the line exactly through the middle of the bed, and with the point of a dibble make light marks one foot six inches apart. That being done, then strain the lines nine inches from the margins of the bed, being a distance of one foot three inches from the middle row to the outside ones. These mark in the same way as the middle one; but so that the plants will not be opposite each other. Every thing being now ready, plants are taken from the seed bed, selecting the finest, and exposing them as little as possible to sun and air. Place one plant over each mark made in the bed, spreading the roots out as regularly as possible on the surface, and laying a little soil with the hand from the alleys on the plants, in order to fix them in their places. The bed being planted, strain the lines on the outside, and with a spade throw the soil from the alleys over the crowns, covering them about an inch and a half, but not deeper. If any burnt vegetable matter can be obtained from the rubbish heap, coat the beds over, about half an inch in depth, with it, after they have been planted. In autumn, when the stalks are ripe, cut them down close, and clean off the beds, taking care not to disturb the soil, the crowns being so near the surface. Make a mixture of equal parts rotten dung and burnt garden rubbish, and coat the beds with it three inches

in thickness, just covering it with soil from the alleys. In this state allow them to remain during winter, and early in March run it through with a fork down to the level of the bed when covered. (*Hort. Soc. Journ.* ii. 40.)

*Autumn Dressing.*—During the whole summer the beds must be kept well hand-weeded, and during that time and in spring we quite agree with those who recommend the plants should be supplied with manure abundantly. Yet we are quite sure that autumn-manuring ought not to be dispensed with, for, from actual experiment, we know that beds alike almost surfeited with liquid manure during the summer, and similarly dressed in the spring, yielded much less from that half of them which was allowed to remain without the addition of any fertilizers in the autumn. At the close of October or early in November the stalks must be cut down and cleared away, and the weeds hoed off into the paths, care being taken not to commence whilst the stems are at all green, for if they are cut down whilst in a vegetating state the roots are very prone to shoot again, and consequently are proportionably weakened. The dung we employ is that of the pig, mixed with straw and well decomposed. We sprinkle a little earth over this manure, but leave that in the alleys quite untouched except by the hoe.

*Spring Dressing.*—In February or March, early in proportion to the mildness of the season, slightly

scarify the surface of the beds with a fork, and give them a coating of night-soil, or pig dung, three or four inches thick. But directions for doing this will be found in the previous section on "Soil and Manures." Before the shoots make their appearance, in the course of April, a slight layer of leaves, two or three inches thick, may be beneficially added. They may be kept from scattering before the wind by a sprinkling over them of earth. These spring dressings afford protection to the young shoots, as well as most desired nutriment; for, as Mr. Cramb, gardener, at Heywood House, Westbury, justly observes, although by some it may be argued that *Asparagus* is as hardy as any other marine plant which inhabits our sea-coast, yet it must be remembered that, when subjected to artificial cultivation, its primitive character is changed by the application of manure, which enlarges the vegetable tissue, and consequently it is less able to resist the effects of cold. (*Gard. Chron.* 1843, 589.)

*Renovating Old Beds.*—The following excellent mode is recommended by Mr. D. Robertson, of Walkenshaw, N.B. :—

Lift the surface clean off the crown of the plant, and from between the rows; take away from six to nine inches of the old soil, or at least as much as can be conveniently without injuring the plants. The vacuities thus made, fill up with a prepared com-

post of ashes and rotten leaves, and about the rows let this compost stand about four inches thick when the operation is finished. On the approach of severe winter weather, cover up the quarter with stable dung, and over the covering frequently, during winter, pour as much of the drainings of the dunghill as you can collect.

The top dressing compost might be thus composed : one-fourth sandy peat moss, from the surface of a dry heath ; one-fourth furnace ashes, well sifted ; and one-fourth vegetable mould, formed from tree leaves ; one-fourth well-rotted stable dung, with a small portion of quicklime, all well mixed and prepared. (*Cal. Hort. Mem.* iv. 479.)

*Taking the Crop.*—This is usually practised without any judgment. The practice most frequently in use in the country, is to leave from the first the weak shoots, which some gardeners say encourage the growth of other shoots without distressing the plant, the shoot left being so weak. These shoots are to be found in the strongest and best Asparagus beds, and if cut, would not be considered worth dressing for a gentleman's table. Another practice, and that more frequently in use in the neighbourhood of London and large towns, is to cut everything away that appears, stout and weak shoots, until a certain day, and then leave off and never cut a stick afterwards. (*Gard. Chron.* 1842, 302.) We have found that a

system intermediate these two is by far the most desirable. It is as follows :—

After cutting about twice in the spring, leave one stout shoot to each stool, with the intention of promoting the fibrous action of the root. As for the rest, cut all that are of any size until about the end of May, when cease cutting a bed or beds of the prime, which now suffer to grow for the earliest produce in the following spring, continuing to cut from the rest until about the end of June. (*Gard. Chron.* 1844, 668.)

The reasons for this and other judicious treatment of the Asparagus at the same season have been so ably enforced by Dr. Lindley and Mr. Beaton, and the practices are so important for the successful cultivation of this vegetable, that we shall give their observations fully, without any fear of sacrificing to them too much space.

You cannot have fruit, says Dr. Lindley, without leaves; and the more abundant the leaves are, provided they are all fully exposed to light and air, the larger and more excellent will be a crop of fruit, within certain limits. But if it is thus true of fruit, it is absolutely true of sprouts, such as those which the Asparagus plant produces; and the reverse of the proposition is equally unexceptionable; that is to say, the fewer leaves are left upon a plant, the more feeble will be its sprouts. To push the illustration to its

utmost limits, we may add that the destruction of the leaves is eventually the destruction of the plant. Those thread-like bodies which clothe the stems of the Asparagus in summer-time act as its leaves, and are incessantly engaged in robbing air and earth of the matter out of which future sprouts are to be formed. That matter the stems convey down into the roots, where it is stored up till it is wanted. The more stems clothed with leaves, the more of such matter, and, consequently, the stronger the sprouts in the succeeding season ; and *vice versa*. If the summer shoots of Asparagus are strong, it is impossible that the sprouts should be weak ; if the summer shoots are weak, it is impossible that the sprouts should be strong. These are facts about which there can be no mistake ; but we fear they are far from being always sufficiently considered. We know very well that, in practice, gardeners will continue to cut sprout after sprout of Asparagus, until the roots are so much weakened, that the latter shoots, which are allowed to grow, are thin, feeble, and evidently struggling with exhaustion. Such debilitated shoots can do little for the roots during the summer, they can barely maintain their own existence, and are, consequently, preparing no new matter out of which sprouts can be formed the succeeding spring, when the crop is, therefore, necessarily weak and worthless. The conclusion to be drawn from this is obvious. No one

should cut too many sprouts from his *Asparagus* bed ; no one should remove limb after limb of his plants, untill they produce nothing but what is too small for table. On the contrary, the gardener should take care to leave at least two or three strong sprouts to grow from every root ; or, which is better, his beds should be rested one year, and cut another ; for he may be certain, from the strength of the summer shoots, what sort of sprouts he will have to cut the succeeding year—remembering always that it is useless to manure *Asparagus* beds for sprouts independently of summer shoots. If a bed of *Asparagus* is weak, manure in the autumn will do but little for making it bring strong sprouts the next season. All that the manure can then do is to feed abundantly the summer shoots of the succeeding summer, and so enable them to prepare plenty of materials out of which a second season's strong sprouts may be pushed forth. What is true of *Asparagus* is equally true of Sea-kale and Rhubarb. (*Ibid.* 1842, 283.)

Mr. Beaton, arguing similarly, says, you may lay down as a rule having no exception, that if your beds have not a vigorous growth in the summer, you will look in vain for fine *Asparagus* in spring. As the succulent shoots proceed from the buried root, their size must be in direct proportion to the healthfulness of that root, or to the quantity of organisable matter that root has stored up. How, then, can the



root be brought into a proper state for producing large shoots? By giving every advantage to the plant during the summer and autumn; so that if your beds this summer are covered with a tall and strong vegetation, the abundance of solar light, &c., will convey a proper supply of matter to the root for next season, and you will cut fine Asparagus; but, on the other hand, if there appears only a stunted and weak growth, your produce will be small. If the principle just laid down is correct, the mode of treatment must consist in judicious cutting, and the application of proper manure. If from any cause the shoots appear thin and spindling, do not cut them at all, but let the bed have a rest during a whole season. The next spring the advantage will be manifest. Nothing would tend more to bring exhausted beds round than this generous treatment, and by the sacrifice of a few dishes now you will secure an abundance next year. What is true of a whole bed applies also to individual plants. Always leave the weak shoots in the beds, on the presumption that by cutting them they will become weaker, but that they will make robust shoots by being allowed to grow and bask in the air and the sun. These remarks also lead to another practical conclusion—to leave off cutting in time. Fine shoots must not be looked at with a longing eye, as though it were waste to let them run to branches and flowers.

They are the parents of a future race, and ought to be kindly and respectably treated. Manure must be plentifully given in conjunction with the above mode of treatment. It should be applied at such times that the growing plant may receive the benefit. It is possible for a top-dressing put on in autumn to have all its valuable properties washed below the reach of the roots, before they begin to exercise their vital powers. However, cover the beds with good dung in autumn, but do not neglect to furnish a fresh supply in spring. Salt and liquid manure should be used at the latter period, as they become immediately available. In April cover them with salt, so that on a dry day the whole surface looks as though it had been snowing; then water with about 60 gallons of liquid manure saved from a stable during the winter. If you have not liquid manure, make some by diluting good stable dung with soap-suds, &c. As the roots will soon begin to move, the soil will be furnished with those materials which will ensure a quick and strong growth, and, if the beds were healthy last year, you may depend on a crop. (*Ibid.* 1846, 204.)

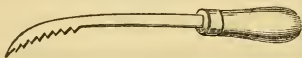
The foregoing remarks by Dr. Lindley and Mr. Beaton are so excellent, that farther comment is almost superfluous. We would here, however, again urge the necessity of rest, before adverted to, providing durability is aimed at. Notwithstanding,

where much *Asparagus* is required for forcing, and one or two beds are required to be taken up each year for this purpose, this kind of rest will become less necessary ; in fact, the beds may be cut rather close for about three years from the commencement of cutting, and then rest entirely one summer. In the ensuing winter such beds will be found in very good condition for forcing. This is our own practice, and we see no reason to depart from it. We force two beds each winter, and plant two fresh ones in lieu thereof. The two fresh beds invariably succeed two celery beds prepared in the Scotch manner, viz., six feet in width. These are prepared of double the depth usual for celery ; the bottom of it containing much vegetable matter in a somewhat raw state, the richer and more decomposed manure being kept nearer the surface. We have a double aim in pursuing this practice ; in the first place we secure a constant succession of what is termed “maiden” grass, which is always very full flavoured ; and in the second, which, in a general scheme of cropping, we consider more important still, some excellent and fresh ground comes to hand annually, for any of the *Brassica* tribes, for which, from their number, variety, and frequent repetition in kitchen garden, it is always a matter of great difficulty to find room.

The *Asparagus* shoots are either cut for use, either with saw or chisel-edged knives, or they are broken

off with the finger and thumb. If due care be exercised, the knife is the best mode, for it least disturbs the roots, and less liability of injury occurs than does by having to uncover the shoot and to thrust the thumb and finger into the soil.

In May the beds are in full production of young shoots, which, when from two to five inches high, are fit for cutting, and as long as the head continues compact and firm. Care must be taken in cutting not to injure those buds which are generally rising from the same root in various grades of successional growth within the ground. The knife ought to be narrow pointed, the blade about nine inches in length, and saw-edged, as thus represented. The



earth being carefully opened round the shoot, to observe whether any others are arising, the blade is to be gently slipped along the stalk until it reaches its extremity, where the cut is to be made in a slanting direction. It almost always occurs that the same stool produces a greater number of small heads than large ones, but the latter only should be cut; for, the oftener the former are removed, the more numerous will they be produced, and the stools will sooner become exhausted.

If the beds be sufficiently large to furnish a supply, the *Asparagus* shoots should be cut as fast as they appear, otherwise they must be left till the quantity

required has pushed forth, in which case, the variety in colour and size prevents them from having so agreeable an appearance. Another knife, of the shape here represented, is often used for this



purpose. In cutting, this knife is to be slipped along the stem, till it reaches the bottom of the shoot, where the cut, as with a chisel, is to be made. The cutting should cease about the end of June. (*Cal. Hort. Mem.* ii. 249.)

In French Flanders, they only use the hand in gathering the shoots. They partially uncover the plants, and break off the Asparagus shoots near the root. Many advantages are said by the Flemings to attend this method: the work-people do not run the risk of cutting the heads of one or more shoots which are not yet come to the surface of the earth; or of wounding the buds of the roots, which are apt to perish when damaged by the point of the knife. This way of gathering has been found also more expeditious: besides, thus moving the earth round the plant keeps it lighter, and lets in more easily to the roots the dew, the rain, and the heat of the sun, which tend to produce larger Asparagus, and in a greater abundance. They break all the Asparagus shoots in the following manner: when the shoot has been thoroughly uncovered by the hand, they lay

hold of it, advancing the first finger and the thumb to the root, and break it easily from the eye or the joint of the root, which is immediately covered again with the same earth. (*Ibid.* iii. 423.)

*Picking off the Berries.*—From the stems that are allowed to grow up, and of which it is the allotted office to elaborate and store up organizable matter in the roots ready for next year's growth, it is a good practice either to pick off the berries, or, still better, to rub off the blossom, as soon as it appears. Every berry is formed at the expense of that organizable matter, and consequently impairs the next year's productiveness.

*Blanching the Shoots.*—In some parts of France it has been said that the shoots of *Asparagus* are improved in size and quality by being inserted within an inverted green-glass bottle, but this does not even partially succeed in England, except when the *Asparagus* is grown in a hotbed. When forced, if the light were totally excluded from a shoot, effects similar to those obtained in France would probably ensue, for we find that in Ireland they insert tin tubes over the heads, and thus obtain very fine ones. These tubes, of course, neither have narrow necks nor admit the light. (*Gard. Chron.* 1842, 471.)

*To obtain Seed.*—Some shoots should be marked and left in early spring; for those which are allowed to run up after the season of cutting is over, are sel-

dom forward enough to ripen their seeds perfectly. In choosing the shoots for this purpose, those only must be marked which are the finest, roundest, and have the closest heads ; those having quick opening heads, or are small or flat, are never to be left. More are to be selected than would be necessary if each stem would assuredly be fruitful ; but as some of them only bear male or unproductive blossoms, that contingency must be allowed for. Each chosen shoot must be fastened to a stake which, by keeping it in its natural position, enables the seed to ripen more perfectly.

*Foreign Modes of Culture.*—In some parts of France, Flanders, and Spain, Asparagus is commonly grown of a quality and size attained only in rare instances in England. We shall append, therefore, some particulars of the cultivation adopted in those countries, especially recommending for as close imitation as possible the Spanish mode, for it has been partially pursued in this country and with very great success.

At the mouth of the Urumea in Spain, is a narrow slip of land, about three feet above high water mark, consisting of alluvial soil and the wearing away of sandstone hills, at whose feet it is placed. This is the Asparagus ground of St. Sebastian. Beds are formed five feet wide, without any previous preparation, except digging and raking. In March the seed



is sown in two drills, about two inches deep, and 18 inches from the alleys, thus leaving a space of two feet between the drills. The rows run invariably east and west, doubtless in order that the plants may shade the ground during the heats of summer.\* When the seedlings are about six inches high, they are thinned to something more than a foot apart. Water is conducted once a day among the alleys and over the beds, so as to give these seedlings an abundant and constant supply of fluid during the season of their growth. This is the cultivation during the first year. The second year, in the month of March, the beds are covered with three or four inches of fresh night-soil from the reservoirs of the town; it remains on them during the summer, and is lightly dug in during the succeeding autumn; the operation of irrigation being continued as during the first season. This excessive stimulus, and the abundant room the plants have to grow in, must necessarily make them extremely vigorous, and prepare them for the production of gigantic sprouts. In the third spring, the *Asparagus* is fit to cut. Doubtless all its energies are developed by the digging in of the manure in the autumn of the second year; and when it does begin to sprout, it finds its roots in contact with a soil of inexhaustible fertility. Previously, however,

\* Spain is hotter than England; therefore, here the rows should range north and south.

to the cutting, each bed is covered in the course of March very lightly with dead leaves, to the depth of about eight inches ; and the cutting does not commence till the plants peep through this covering, when it is carefully removed from the stems, in order that the finest only may be cut, which are rendered white by their leafy covering, and succulent by the excessive richness of the soil. In the autumn of the third year, after the first cutting, the leaves are removed, and the beds are again dressed with fresh night-soil as before ; and these operations are repeated year after year. In addition to this, the beds are half under salt water annually at spring tides. Let any one compare this mode of culture with ours, and there will be no room for wondering at the difference in the result. The Spaniards use a light, sandy soil ; we are content with any thing short of clay. They irrigate ; we trust to our rainy climate. They know the value of salt water to a sea-coast plant ; we take no means to imitate nature in this respect. They dress their beds with the most powerful of all manures ; we are contented with the black residuum of a cucumber frame, which is comparatively a *caput mortuum*. Finally, they throw leaves lightly over their beds, by which means they expose the young sprouts to the least amount of resistance, and force them onward by the warmth collected from the sun by such beds of leaves ; we, on the other

hand, compel the *Asparagus* to struggle through solid earth, capable in the smallest possible degree of absorbing warmth during the day ; but, on the other hand, ready to part with its heat again at night to the greatest possible amount. Can any one wonder, then, at the poor results obtained by our manner of cultivation ? or that some gardener should now and then astonish his neighbours by producing *Asparagus* which we call giant, but which at St. Sebastian would be called second-rate ? (*Gard. Chron.* 1842, 187.)

The culture of *Asparagus* at St. Sebastian is exceedingly interesting to the lover of progress, as throwing light on the use of rotten leaves, highly stimulating manures, and saline matters. It must be remembered, however, that a much greater demand exists on the plant in the way of perspiration in this part of Spain than in Britain. It may be noticed, also, that the application of salt water only takes place at spring tide ; this will show that we north-men may apply salt without any danger either during or at the conclusion of the rest season.

The covering of leaf soil for the sprouts to come through is a most judicious proceeding ; and, moreover, an advantage which any amateur in a small way may avail himself of, by collecting in due time the rakings of his shrubbery or lawn, short grass mowings, very old and spent tan, and suchlike matters, preparatory to the spring dressing. Such at

St. Sebastian must be very useful as a mulching ; or, in other words, it will ward off part of the intense sunshine.

At Marchienne, in French Flanders, particularly noted for fine Asparagus, the plants are inserted two feet and a half distant from each other, at one foot from the edge of the bed, in the quincunx order. The roots are covered an inch thick with earth, on which are laid two inches of dung, or good hot-bed soil ; and at last two inches more of mould. That the earth may not be unequally pressed, or partially condensed, a slight board is used for treading on. During the two first years after planting, the shoots should not be gathered for use, that the plants may gain strength ; for should a single shoot be cut during that interval, it would materially hurt the plant, not only in preventing its acquiring its natural size, but also in shortening its duration. A bed well managed may last at least from twenty-five to thirty years. In the two first years the plants must be uncovered, about the end of November, down to the bud or top of the shoot, and covered again with five or six inches of good rotten dung, and left so till the month of April. The earth taken out in November, which has remained, during the whole winter, on the sides of the bed, and has been of course improved by the action of the atmosphere, is to be thrown over the plants again in April, to the depth of six inches.

After these two first, and during the following years, the beds are likewise uncovered every year in October, and immediately after Easter they are covered again, with at least a foot of good well sifted mould, that the *Asparagus* shoots may grow longer. It seldom happens that the plants fail when thus managed, and when the dung, before the planting, has been well and equally trodden in; but should this be the case, they may be replaced by others, which must be treated in the same way as above directed. (*Cal. Hort. Mem.* iii. 421.)

About Nice and other parts of France, where *Asparagus* culture is very successfully practised, Dr. Macculloch informs us that the following is the system of culture:—

The quarter must be divided into beds five feet wide, by paths constructed of turf, two feet in breadth and one foot in thickness. The *Asparagus* must be planted about the end of March eighteen inches asunder. In planting them, the bud, or top of the shoot, is to be placed at the depth of an inch and a half in the ground, while the roots must be spread out as wide as possible, in the form of an umbrella. A small bit of stick must be placed as a mark at each plant, as it is laid in the ground. As soon as the earth is settled and dry, a spadeful of fine sand is to be thrown on each plant, in the form of a molehill. If the *Asparagus* plants should have begun to shoot

before their transplantation, the young shoots should be cut off, and the planting will, with these precautions, be equally successful, though it should be performed in this country even as late as July. Should any of the plants originally inserted have died, they also may be replaced at this season. The plants ought to be two years old when they are transplanted; they will even take at three; but at four they are apt to fail. If it be necessary to buy *Asparagus* plants for these beds, it will be proper to procure twice as many as are required. The best must then be selected for planting, and the remainder placed in some remote portion of the prepared bed, or into a similar situation, but without separating the plants. Here they must first be covered with four inches of sand during the summer, and as soon as the frosts sets in, with six inches of dung over that. (*Ibid.* ii. 248.)

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## FORCING.

BEFORE proceeding with the various modes of *Asparagus* forcing, it will be well to remark, that no mode, be it ever so complete or scientific, can ever produce good *Asparagus* if the crowns are weak, or, in other words, unless the plants have made strong shoots

the summer previously, and a comparative freedom or rest from the knife. It is a serious mistake to think of forcing old and worn-out beds ; to be sure, if such are to be broken up, it is, perhaps, better to force them than to throw the roots away ; but why keep beds until they are worn out ?

We have before urged that the cultivation of Asparagus, carried well out, is not only exceedingly profitable in itself, but is, when forming part in a regular and systematic rotation of crops, one of the most important matters connected with the garden. The Brassica tribes are so numerous, and required in such frequent succession, that the soil frequently becomes, in technical phraseology, "tired" of this family. The greatest of renovators, therefore, are, of course, those crops which remain longest on the plot of ground assigned to them, and of such we would particularly name the raspberry, the strawberry, and the asparagus. The Brassica family will, of course, follow such crops well, and the exhausted Brassica ground may be brought in order by celery beds, or otherwise, for any of the above restorers.

We would now merely observe, that Asparagus forcing, under whatever mode, necessarily falls under two sections, viz., forcing it in its growing bed, and removing it to pits, frames, or houses, to force.

There are various modes practised, concerning which we shall give the necessary details, but what-



ever mode be adopted, the earliest time to commence forcing is at the end of September. If the heat is well sustained, the plants will produce available shoots in the course of from four to six weeks, according to the length of the days, and will continue in production for about three weeks. To have Asparagus at Christmas, begin forcing in the middle of November.

*Forcing the Open-ground Beds.*—This mode was first suggested by the late Mr. P. Lindegard, gardener to the King of Denmark. His directions are succinctly as follows :—Stir up the beds in the open garden with a fork, about five weeks before you wish for a cutting, and heighten them with a spit taken from the alleys, which are to be two feet wide, and the beds four feet wide, having two rows of plants on each bed ; deepen the alleys to three-and-a-half feet, then fill them with hot fermenting dung, and cover the beds with litter. One plank over the alley, and another along the centre of the bed, between the two rows, will enable a man to walk and gather the crop, without injuring anything. (*Trans. Hort. Soc.* v. 79.)

The open-ground forcing, in the ordinary beds, is sometimes tolerably successful, but on the whole we should consider it inferior to some of the other modes, unless planted specially for the purpose in short lengths, running north and south. For in forcing an ordinary bed it takes a considerable

amount of dung to penetrate one row only on each side ; when, however, instead of one long bed we have several short ones, parallel, we can fill several trenches, which then act in concert, and the whole mass of soil becomes warmed. When, however, pigeon-holed brickwork is added to support the sides, the whole becomes much more complete and permanent.

Mr. D. Spiers, formerly at Mr. Knight's Nursery, King's-road, has improved upon this plan : he makes the beds in width 4 feet 8 inches, and bounded on the sides by pigeon-holed brickwork, 2 feet deep, and they should be east and west, in order that the frames may face the south. A bed of 60 feet in length will require three frames of 15 feet in length each, and 4 feet 6 inches wide. The compost for the bed must consist of one-half sandy loam, one-fourth bog, or good vegetable mould, and one-fourth good rotten dung, all well mixed together. With this fill the bed, so that, when settled down, it may be a little higher than the brickwork. The side trenches should be 2 feet wide and 2 feet deep ; these are intended to receive the linings. Along the middle of each trench a drain should be made of common draining tiles, to keep the linings free from water. The bed will hold four rows of plants, 11 inches distant from each other and from the sides of the beds. Strong one-year-old plants should be preferred, and planting in

the month of April. The plants should be allowed three years to establish themselves before they are forced. In the month of October, before it is intended to begin forcing, the stems should be carefully cut off, and the surface cleared, and covered with littery straw, 12 inches thick ; the trenches may also be filled with the same, in order to keep the whole dry. If forcing is to begin on the 1st of December, clear away the covering of litter to about 18 inches farther than the length of the first frame ; fill the trenches with good, hot, stable-yard dung, well beaten down, and carry up to about 18 inches higher than the surface ; next fork up and rake the surface of the bed, and immediately cover it, from lining to lining, with prepared dung, a few inches higher than the linings. In about twelve days after applying the dung examine the bed. If the buds have begun to appear, or as soon as they do, get the frame and lights ready to be put on ; remove the dung from off the bed, laying it on each side, the greater portion to the back ; when the bed is cleared, sift over the surface a little previously prepared fine mould ; set on the frame and lights immediately, and work up the linings with the dung taken off the bed, laying a part at the ends ; and then double mat the frame for two days. When the linings have taken their fresh heat, the covering may be removed every morning as early as the weather will permit, again matting up early

enough in the afternoon, and keeping up the heat of the linings, should they decline. When the shoots have risen about 2 inches, particular attention should be given in admitting air, in order that the crop may have a good colour; and, with such management, cutting may commence on Christmas-day. In ten days after the crop in the first frame comes into use, preparations must be made for the second, and so for the third, in the way above described. The frames are placed close to each other, and all managed in the same way. The remaining portion of the bed receives the first frame, and will only require a back and front lining, which will give, assisted by the second and third frames, a fair supply till the natural crop comes in. When the forcing is over, the bed should be covered, 3 inches thick, with rotten dung; and if occasionally watered in the ensuing summer with manured water, it much assists plants which are intended to be forced every season. If the dung in the trenches is wanted for other purposes, they should be filled with litter, to preserve the sides of the bed from drought. Forcing should not be begun always at the same end of the bed, but alternately. Wood covers, 15 feet 6 inches in length, by 4 feet wide, are very useful for sheltering the bed by night, or in severe weather, especially in keeping the whole dry. It is needless to show how far this system of forcing *Asparagus* may be extended, or to point out to practical

men the advantages attending it. Parallel beds may be forced in the same way, so that the intermediate linings be not too much trodden on, as this always checks their working kindly. Beds so treated will continue productive for many years. (*Gard. Mag.* iv. 360.)

It may here be remarked, that Mr. Spiers, as we well remember, was amongst the very first to lead the way in this mode of forcing. His principles are undoubtedly right; he, however, errs, we conceive, in point of the direction of the beds. We cannot but think, that in *Asparagus* cultivation, as also in the cultivation of most crops, that rows north and south are at all times preferable to those east and west. In thus judging we assume two points, viz., that plants in that direction enjoy more light, and that the aggregate amount of light, during the growing season, in Britain is certainly no more than sufficient.

Mr. Spiers used, we think, glass frames, but there is not the least need of them. We have grown for the last twelve years first-rate *Asparagus* in such pits with a wooden span roof, which we shall here describe.

Our brick pits are pigeon-holed; the pits are forty-two inches in width, and the alleys about twenty-six inches. The beds receive only two rows of *Asparagus*, which are planted about nine inches from the exterior walls, thus leaving a space of about twenty-

four inches between the two rows. The beds are north and south, and in lengths of nine feet, and being in parallel lines, one lining, of course, works what is equivalent to a whole bed,—viz., a couple of rows. The plants are placed only ten inches apart, and the quantity of produce in weight that has been obtained from these beds, for years, is truly surprising. We never had the curiosity to weigh the produce, but this we can say, that our *Asparagus* has generally excelled that of all competitors at the country shows. We have no very distinct mode of cultivation for these pits, merely putting in practice the manurings and other matters connected with high cultivation, described in the section on open-ground culture. We take care, after forcing, to protect with litter the straggling shoots remaining above ground, and suffer the beds to rest for one season. Here, as in open-ground culture, we lay the utmost stress on feeding the plants in the alleys by means of their annual roots, and to this end we turn over the remains of the fermented materials in the alleys in the month of April, using soil or other old matter to blend with the manure, in order to induce a rapid and vigorous action of root. The roots they make in one summer, in a proper medium, is indeed surprising, and any one closely observing this would, we think, on due consideration, at once see the propriety of paying extra attention to the alley cultivation. We may here state, that our

wooden covers are of a span-roofed character; the roof of a very flat pitch; the sides, which rest on the brickwork, are about nine inches high; and the cover, altogether, is nine feet, one covering the whole bed. The roof is formed of what is termed "feather-edged boards," and the second of these is not nailed fast, but may be drawn down at pleasure to inspect or cut the crop. The forcing routine is very similar to that so ably described by Mr. Spiers.

*Forcing in Stoves, Pits, &c. Age of Plants.*—Such plants must be inserted in hotbeds as are five or six years old, and appear of sufficient strength to produce vigorous shoots; when, however, any old natural ground plantations are intended to be broken up, at the proper season some of the best plants may be selected to be plunged in a hotbed or any spare corner of the stove bark beds. When more than ten years old, they are scarcely worth employing. To plant old stools for the main forcing crop is, however, decidedly erroneous; for, if plants are past production, and unfit to remain in the garden, little can be expected from them when forced.

*Produce.*—To have a regular succession, a fresh bed must be formed every three or four weeks, the last crop to be planted in March or the early part of April: this will continue in production until the arrival of the natural ground crops. The last made



beds will be in production a fortnight sooner than those made about Christmas.

If the forcing be conducted in a pit or hotbed, and the plants are placed very close together, each light will afford a gathering once in three days, and yield altogether between 300 and 400 heads.

*In Vinery or Peach-house.*—Mr. Niven says that, perhaps there is no more simple or successful mode of forcing than that of placing the roots in the border of an early vinery or peach-house at work, where, by being closely placed together, the spaces between the roots filled up with fine mould, and covered over about two inches above the crowns, the produce will be rapid and regular, in proportion as the house may be more slowly or quickly forced. A succession may be kept up in this way, where there may be several such forcing-houses ; as it is only in the early stage of the forcing of such houses that *Asparagus* will succeed best when grown in them. In a similar way a good succession of *Asparagus* may be kept up from an exhausted tan-pit, where pines have been grown the preceding season. (*Gard. and Flor.* iii. 147.)

We must here observe that, where the establishment possesses a peach-house and early vinery, there is also generally a spare frame or pit, and such will be found more eligible for the purpose. There is generally some inconvenience arising from applying such houses to this purpose ; nevertheless, when no

objection exists, *Asparagus* may be forced in such situations.

*Forcing in Dung Beds and Pits. Bed.*—The hot-bed must be substantial, and proportioned to the size and number of the lights, and to the time of year. The common mode of making a hotbed is usually followed. The bed must be topped with six inches of light rich earth.

*Quantity necessary.*—If a small family is to be supplied, three or four lights will be sufficient at a time ; for a larger, six or eight will not be too many. Several hundred plants may be inserted under each, as they may be crowded as close as possible together; from 500 to 900 are capable of being inserted under a three-light frame, according to their size.

*Mode of planting.*—In planting, a furrow being drawn the whole length of the frame, against one side of it the first row or course is to be placed, the crown upright, and a little earth drawn on the lower ends of the roots, then more plants again in the same manner, and so continued throughout, it being carefully observed to keep them all regularly about an inch below the surface ; all round on the edge of the bed some moist earth must be banked close to the outside roots.

*Precautions necessary.*—If the bed is extensive, it will probably acquire a violent heat ; the frames must therefore be continued off until it has become regular,

otherwise the roots are liable to be destroyed by being, as it is technically termed, scorched or steam-scalded.

*Treatment.*—When the heat has become regular the frames may be set on; and more earth be applied by degrees over the crowns of the plants until it acquires a total depth of five or six inches.

The glasses must be kept open an inch or two, as long and as often as possible, without too great a reduction of temperature occurring, so as to admit air freely and give vent to the vapours; for on this depends the superiority in flavour and appearance of the shoots. The heat must be kept up by linings of hot dung, and by covering the glasses every night with mats, &c.

The old practice of forcing in dung-beds is not to be excelled as to the speedy production of good Asparagus; and as we have practised this to a considerable extent for the last twenty years, and with very excellent success, we will just give a detail of our practice. We throw the dung together to ferment, and turn and water it a couple of times. When tolerably sweet, a frame is selected—generally an old dilapidated one—and the bed is built about two or three feet high at back, according to the season of the year. In building the bed, a very small amount of the dung is made use of, the chief of the bulk being tree leaves. We place a foot of leaves on the ground, then a foot or nearly so of the dung, and

carry up the remaining height chiefly with the leaves, raising a kind of rim of dung all round the frame at last, in order to form a deep cavity within to contain the roots. We then, without waiting for the heat to rise, place the roots on the surface, first coating the warm leaves with three inches of old mellow and very rotten manure. The plants are taken up with their roots as entire as possible, and placed as thickly together as they can be packed, and when the frame is filled, a little very old tan is strewed through them, washing it into all the crevices with tepid water; the water, however, at this period we use as sparingly as possible. The crowns being barely covered, we close up the frame, and cover it with mats, nailing them close down. A lining is then applied all round the frame, carrying it as high as the top of the wood-work. In the course of three or four days the heat will rise; and at this period the frame requires close attention, or the roots will burn. When the bottom heat reaches 85 degs. we give the whole a thorough watering with tepid water, in order to reduce or check the heat, using good liquid manure, and putting a single handful of common salt in each large water-can; these hold about three or four gallons of water. This settles the earth into every crevice, and reduces the heat to about 70 or 80 degs. We then cover the whole surface with about six inches of old tan. In a couple of days it should be closely examined, and the

bottom heat proved, when, if it shows a disposition to rise beyond 75 degs., we water again with a similar mixture, and withdraw a part of the lining; indeed, we hereafter manage the internal heat by the linings, applying or withdrawing them at pleasure. Little trouble of this kind, however, occurs, as the leaves are neither so violent or so fitful as dung. As soon as the *Asparagus* comes through, we take off the mats, and commence giving air—night and day, if possible—and gradually inure the shoots to the light. When the crop is nearly all through, we water again with the saline mixture in a tepid state, and endeavour by all means to increase the air, preserving still a small bottom heat of about 70 degs. If the *Asparagus* comes to hand too fast, and is required to be kept back for special occasions, we merely lower the bottom heat with more water. By these means we have excellent success, and with a small amount of trouble. The *Asparagus*, too, is well coloured, and might be taken for the production of out-door beds in the month of May.

Mr. Davison, gardener to Sir J. Guest, Bart., of Dowlais, Glamorganshire, has given a very good detail of the routine of culture in pits. He observes, that this system of forcing in pits is beginning to become general, and is in every respect much better than with dung. The pits can be erected at a moderate expense; and, with a trifling additional outlay,

we can have *Asparagus* the whole of the winter. It is not necessary that these pits should be formed with more than six or eight of the ordinary sized garden-lights ; and where a general succession is required, there should be two such pits in use for that purpose. They should be heated with hot water pipes or smoke flues. Hot water is the best, and by adopting it the two pits may be readily heated from one boiler, with the necessary stop-cocks. The pits should be so constructed that the plants will be near the glass, that they may enjoy the benefit of the sun when in a growing state : this is a particular point to be noticed in forcing *Asparagus* as well as other plants. The roots to be forced should, at least, be six years old, and such that have sent up strong stems the preceding summer. The plants thus selected, and intended for this purpose, should either be covered with rough litter, to prevent the frost entering the ground where they are ; or, otherwise, they should be taken up, and deposited in sand, where they will not become too dry. In the pits, when prepared for them, there should be three or four inches of soil placed ; the roots of the plants should as much as possible be preserved at the time of lifting, and they should be placed in the pits as level as possible ; then, with a sieve, sift among the roots some fine soil, decayed tan, leaves, or any thing that is light, and will readily fall in among them : this must be done to the depth

of four or five inches, then give the whole a good watering to settle the soil ; close the pit, and keep it so till vegetation commences, and then air must be admitted freely, and all the light that can possibly be secured : this materially assists in getting the buds of a fine green colour and good flavour. The temperature of the pits may range from 45 to 60 degs. Fahrenheit ; but 50 and 55 degs. is best as the highest, unless it is required to provide a supply for some particular day. Where pits are heated by hot water, it is an easy matter to steam them, which is highly beneficial when the plants are in a state of vegetation. Thus managed, the plants require but little water, particularly in the winter months : but it must be borne in mind that, when it is required and applied, it must be of the same temperature as the pit in which the plants are growing. Where a general succession is wanted, this method will be found to answer ; a fresh plantation must, however, be made about every 12 or 18 days. It is not necessary, in forcing *Asparagus*, that it should have bottom heat ; but where a small quantity is required, it is often forced on dung beds, and in such cases the grower should be cautious against a strong bottom heat, which, accompanied by the steam from the dung, is injurious to the plants when in a growing state. Where it is wanted, even in small quantities, the frame is best placed on brickwork, with pigeon-holes



in it, as recommended by M'Phail; and the bottom may be covered with slate or bricks, and thus the steam will entirely be prevented from getting among the plants. (*Flor. Journ.* 1845, 31.)

That Mr. Davidson's plan, here described, will succeed there can be no doubt. To build pits with hot water piping for this purpose is, however, a rather costly affair, unless they are intended for growing melons in afterwards, in both which cases we think that a tank bottom heat would be a valuable adjunct. Indeed, we do not see why the atmospheric heat necessary should not be produced by means of a tank bottom heat alone; slides to graduate being provided in order to admit atmospheric moisture from the chamber containing the pipes, at pleasure. With all due respect, we must beg to differ from Mr. Davidson in one matter. He seems to think bottom heat almost unnecessary: we think it the grand essential in the whole affair.

*Temperature.*—The night temperature should not be below 50 degs., though some gardeners do not object to 45. The day temperature may range from 60 to 65 degs. It must be borne in mind that Asparagus is very impatient of a high temperature to its roots, therefore the bottom heat should be carefully attended to.

We are here tempted to offer a suggestion as to a kind of simple pit, which would, we conceive, be very

useful to the amateur in a small way ; for such can scarcely hope to build pits, and apply hot water for the forcing of *Asparagus* alone. The little greenhouse of the owners of small gardens is too frequently crowded to suffocation in the months of March and April ; the *Fuschias*, the Hybrid *Roses*, the *Calceolarias*, the *Corierarias*, the *Geraniums*, &c., &c., begin to enlarge at that period, and to shoulder each other. A pit, or pits, therefore, that would grow *Mushrooms*, and force *Sea-kale*, *Asparagus*, and *Rhubarb*, through December, January, and February, might be so planned as to receive the thinnings of the greenhouse in the middle of March, and be made available for store plants, or as a temporary protection to *Ericas*, or choice *New Holland*, or other plants, through the summer. We would, therefore, suggest narrow brick pits, built almost entirely below the ground level, with walls, pigeon-holed up to a certain height ; this level kept below the surface of the bed inside.

A retaining wall for linings would, perhaps, be necessary. These pits need not be more than three feet wide, and, instead of glass, might be fitted with a kind of wooden box, possessing a slanting opaque roof, with hinges made to tilt up at pleasure. By introducing a bottom heat of well-fermented dung, or dung and leaves, in the early part of November, and applying linings, the above roots might be easily forced.

The Hyacinth and other Dutch bulbs, which require darkness, would also find a place here.

In the middle of March the surface of the rotten manure might be taken away for the garden purposes, and its place supplied with coal ashes or sand, after lime-watering the whole to destroy the earth worm. The linings might also be in part removed, and their surface cased over, and rendered solid, for the proprietor to walk over with comfort. Such a pit in summer would serve to keep successions of choice stock in for the greenhouse or drawing-room; the lids being propped up in the day, and closed, or partly so, at night.

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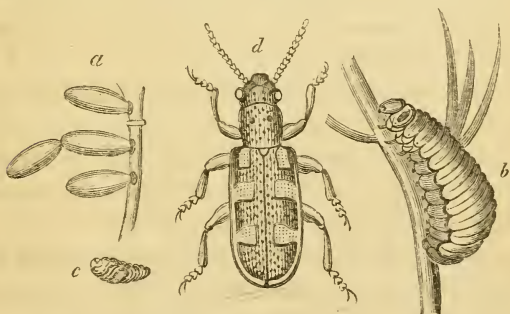
## DISEASE AND INSECTS.

WE are not aware of any disease to which *Asparagus* is liable, for although its roots occasionally decay to an injurious extent, it is only when they have been wounded by careless cultivation.

*Slugs* sometimes deface the young buds of *Asparagus* to a great extent; especially on stagnant soils, and in cold periods, when the "grass" grows slowly. The late spring frosts, which sometimes damage this crop, will frequently so stagnate the progress of the buds, both above and below the surface, that slugs,

snails, &c., feed upon and deface them. An abundant application of salt is the best remedy.

*Crioceris asparagi*.—The Asparagus Beetle. For the following description and particulars relative to this occasionally destructive, though beautiful little coleopterous insect, we are indebted to Mr. J. O. Westwood, F.L.S. It is usually about a quarter of inch in length, of an oblong form, with the head rather broader than the thorax, which is cylindrical, and narrower than the elytra. Its general colour is a fine blue black: this is the colour of the legs and head; the antennæ are black; the thorax, or, more properly speaking, the upper surface of the prothorax, is of a fine red, with two dorsal black spots, which, in some individuals, are so small as to be scarcely visible. The elytra are long, each having several rows of impressed spots; the external margin



is orange-coloured ; the central part, or suture, blue black ; the disc of each elytra is varied with cream-coloured and blue black marks, which have somewhat the appearance of a cross, being in the centre of the back. These spots vary occasionally in their size : sometimes, for instance, the pale humeral spot is wanting, and in others the bars of the cross disappear. The specimen figured represents the ordinary appearance of the insect ; the eggs (*a*) ; the larva (*b*) ; the pupa (*c*) ; and the perfect insect (*d*) ; all greatly magnified.

The injury, we have no doubt, which a young seedling bed would receive from its attacks would have the effect of greatly weakening the roots ; for the whole of the leaves (as we may term the slender elegant spray) being entirely consumed, the plants would necessarily lose a great deal of nourishment, and be less able, in the following spring, to throw up good heads, which, of course, it is the cultivator's chief interest to obtain.

It is not, however, by the insect in the perfect state that the mischief is caused : at this period of its existence, its whole object is to continue its kind, and eating is no longer a matter of necessity ; it is by the larva, or grub, that the injury is produced.

The females deposit their eggs upon the young and tender stems, seeming to prefer those which support the flowers. These eggs are of a long oval form, and

of a large size compared with the insect ; hence, it is probable that a single female does not deposit above eight or ten eggs. They are affixed to the stem at one end, by means of a black viscid secretion, which dyes the surrounding part of the stem for a short distance. We have often observed two eggs placed together, one by being attached at the extremity of the other. Their colour is dirty slate. In a short time the larvæ are produced. In this state, they are quite the reverse of their parents, and, instead of exhibiting a variety of colours and elegant markings, they are of a disgusting form and a dirty slaty green colour, almost black ; and, when disturbed, they emit a considerable quantity of thick black fluid. The body is, as usual, composed of 13 segments, the first of which, or the head, is black, and supplied with strong four-toothed jaws, and short antennæ ; the next segment, or the prothorax, is marked with two shining black spots, of a leathery texture, and is furnished on the under side with two short, articulated, black legs, as is also each of the two following segments ; the remaining segments are gradually thickened. The general consistence of the body is fleshy, the external integument being thin and membranous ; the segments of the abdominal part of the body are furnished with fleshy tubercles, which are employed as legs. The body is also armed at its extremity with a similar pair of these fleshy proleg-like tubercles. It

is the habit of the larva of the typical species of this genus (*Crioceris merdigera* Linn,) to form a covering for itself of its own excrement (in the manner described by Reaumur, and introduced into the Insect Architecture); but the larva of the *Asparagus* beetle is different in its habits, following the ordinary plan in this respect. The larva are to be found from the end of June till September. They, of course, do not appear until the *Asparagus* is sufficiently grown for their support; the eggs being deposited on the plants, and not in an adjacent situation; and they arrive at their full growth in about a fortnight. They are most partial to the tenderest shoots.

They shed their skins several times, the exuviae being visible amongst the unconsumed twigs of the *Asparagus*. When full grown, the larvæ descend into the ground, where they construct a thick pergameneous cocoon, in which they are transformed into white pupæ of the ordinary form; the limbs, antennæ, and wings being folded in separate sheaths along the breast.

This state lasts about another fortnight, so that six or seven weeks may be considered as the duration of the insect's life, one-third of which is occupied by the egg, another third by the larvæ, and the remaining third by the pupa and imago states. The perfect insect will, however, live a long time if confined.

Some individuals, also, survive the winter; indeed,



we are inclined to think that the insect, through this inclement part of the year, is in the imago state, hidden in some secret place or other, and not in the pupa state, as is ordinarily the case with insects in general. Certainly, the closely-allied species, *Crioceris cyanélla*, may be found under the bark of willows throughout the winter ; and Mr. W. saw a perfect specimen of the *C. asparagi* creeping about the asparagus bed as soon as ever the plants appeared above ground. This, of course, is an important part of the insect's economy ; because, if the fact be as he supposes, it will be evident that the beetles, which make their appearance in the spring, are destined to be the parents of the whole of the future broods ; and, therefore, by bestowing a little trouble during the time of cutting the asparagus, in order to kill the few beetles then visible (which, from their bright and lively colours, would be a very easy task), much of the subsequent injury would be remedied. It is certain, however, that, if this precaution be not taken, the propagation of the insect is very rapid ; and as, during the summer months, it is to be found in the egg, larva, and imago states, at the same time on the same plant, it is evident that there is no regularity in the succession of the broods. Even afterwards, when the asparagus is full grown, some of the plants are liable to be entirely stripped of their foliage by the larva ; and it would be worth while, even then, to catch as many

of the perfect beetles as possible, in order to diminish the invaders of the next year's crop. The beetle is, however, very cunning ; for no sooner is it approached than it turns to the under side of the stalk, and, if disturbed, drops down and feigns death. We have found the best thing to use was a green gauze bag-net, held under the plants, which were then shaken, and the insects fell into it.

*Crioceris 12-punctata* (Linn) is another species of the same genus, which is also found upon the asparagus. In this country, however, it is extremely rare. (*Gard. Mag.* 1837, 337.)







